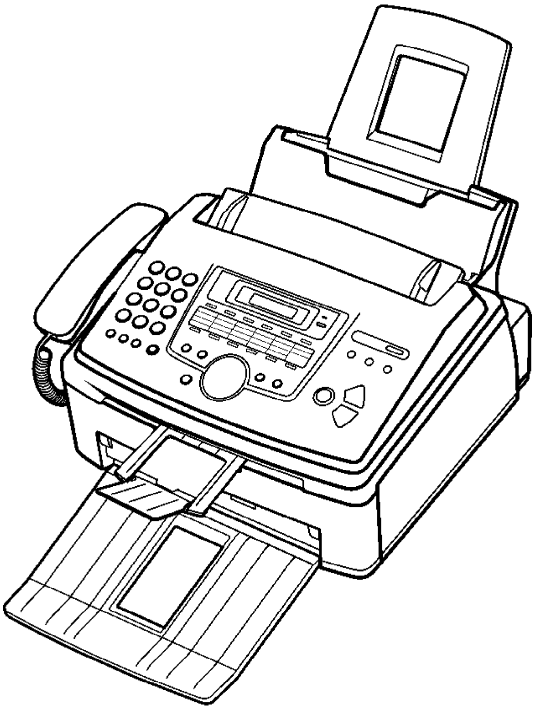
ORDER NO. KMF0309705C3

Service Manual

High Speed Laser Fax and Copier

KX-FL512CX

(for Asia, Middle Near East and Africa)



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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

When you note the serial number, write down all of the 11 digits. The serial number may be found on the bottom of the unit.

Panasonic

IMPORTANT INFORMATION ABOUT LEAD FREE, (PbF), SOLDERING

If lead free solder was used in the manufacture of this product the printed circuit boards will be marked PbF.
Standard leaded, (Pb), solder can be used as usual on boards without the PbF mark.
When this mark does appear please read and follow the special instructions described in this manual on the use of PbF and how it might be permissible to use Pb solder during service and repair work.

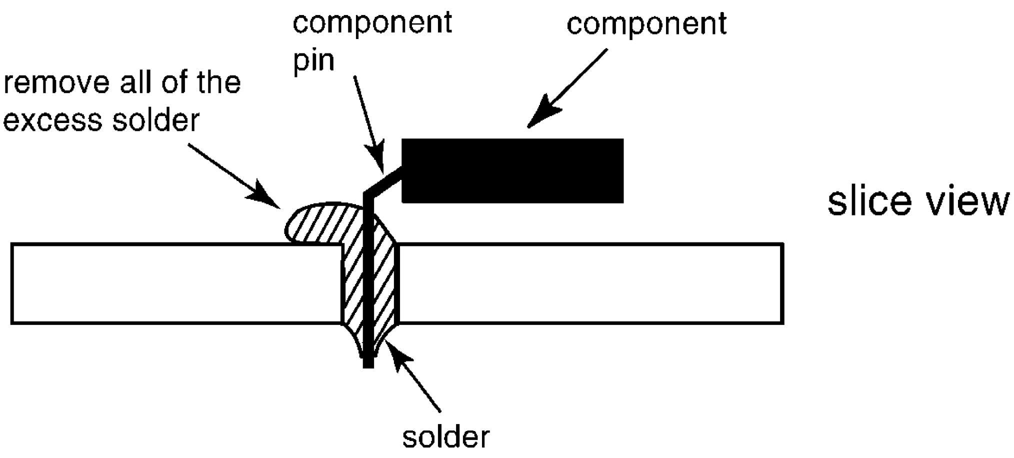
1. INTRODUCTION

1.1. ABOUT LEAD FREE SOLDER (PbF: Pb free)

Note:
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.
We will use PbF solder when discussing the lead free solder used in our manufacturing process which is made from Tin, (Sn), Silver, (Ag), and Copper, (Cu).
This model, and others like it, manufactured using lead free solder will have PbF stamped on the PCB. For service and repair work we suggest using the same type of solder although, with some precautions, standard Pb solder can also be used.

Caution

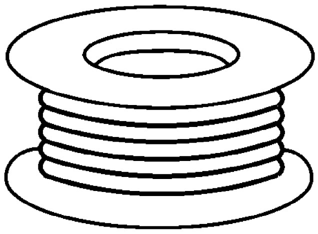
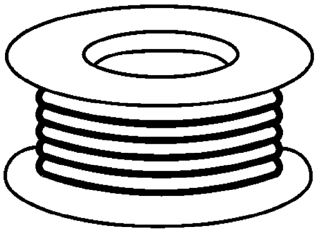
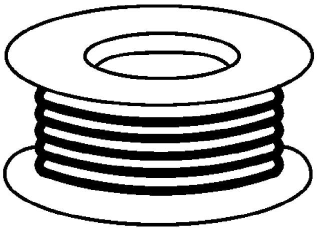
- **PbF solder has a melting point that is 50° ~ 70° F, (30° ~ 40°C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700° ± 20° F, (370° ± 10°C). In case of using high temperature soldering iron, please be careful not to heat too long.**
- **PbF solder will tend to splash if it is heated much higher than its melting point, approximately 1100°F, (600°C).**
- **If you must use Pb solder on a PCB manufactured using PbF solder, remove as much of the original PbF solder as possible and be sure that any remaining is melted prior to applying the Pb solder.**
- **When applying PbF solder to double layered boards, please check the component side for excess which may flow onto the opposite side (See figure, below).**



1.1.1. SUGGESTED PBF SOLDER

There are several types of PbF solder available commercially. While this product is manufactured using Tin, Silver, and Copper, (Sn+Ag+Cu), you can also use Tin and Copper, (Sn+Cu), or Tin, Zinc, and Bismuth, (Sn+Zn+Bi). Please check the manufacturer’s specific instructions for the melting points of their products and any precautions for using their product with other materials.

The following lead free (PbF) solder wire sizes are recommended for service of this product: 0.3mm, 0.6mm and 1.0mm.

0.3mm X 100g	0.6mm X 100g	1.0mm X 100g
		

1.2. HOW TO RECOGNISE THAT Pb FREE SOLDER IS USED

P.C.Boards marked as “PbF” use Pb Free solder. (See the figure below.)
Pb Free is not used the Power Supply Board of this unit.
(Example :Digital board)

Note : The “PbF” marked may be found on different areas of the same P.C.Board,depending on manufacture date.

1.3. SAFETY PRECAUTIONS

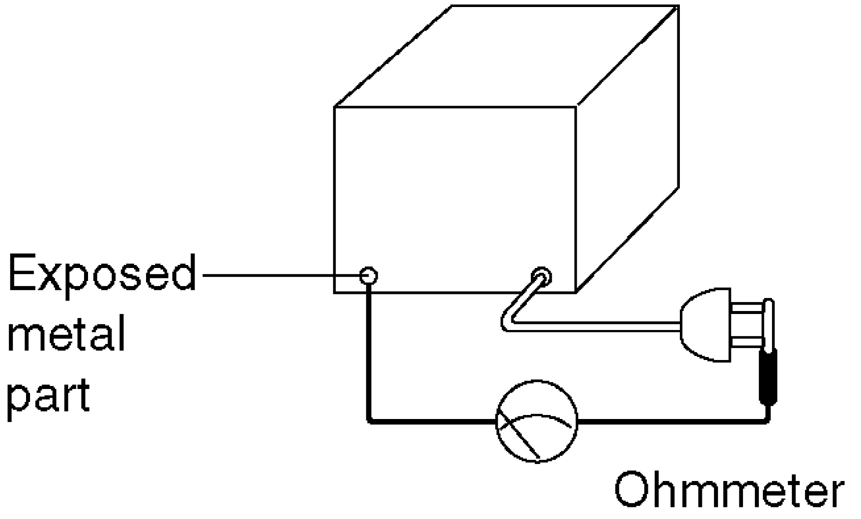
1. Before servicing, unplug the AC power cord to prevent an electric

shock.

2. **When replacing parts, use only the manufacturer's recommended components.**
3. **Check the condition of the power cord. Replace if wear or damage is evident.**
4. **After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.**
5. **Before returning the serviced equipment to the customer, be sure to perform the following insulation resistance test to prevent the customer from being exposed to shock hazards.**

1.4. INSULATION RESISTANCE TEST

1. **Unplug the power cord and short the two prongs of the plug with a jumper wire.**
2. **Turn on the power switch.**
3. **Measure the resistance value with an ohmmeter between the jumpered AC plug and each exposed metal cabinet part (screw heads, control shafts, bottom frame, etc.).**
   Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.
4. **If the measurement is outside the specified limits, there is a possibility of a shock hazard.**



Resistance = more than 10MΩ (at DC 500 V)

1.5. FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.
When repairing, the following precautions will help prevent recurring malfunctions.

1. **Cover the plastic part's boxes with aluminum foil.**
2. **Ground the soldering irons.**
3. **Use a conductive mat on the worktable.**
4. **Do not touch the IC or LSI pins with bare fingers.**

1.6. BATTERY CAUTION

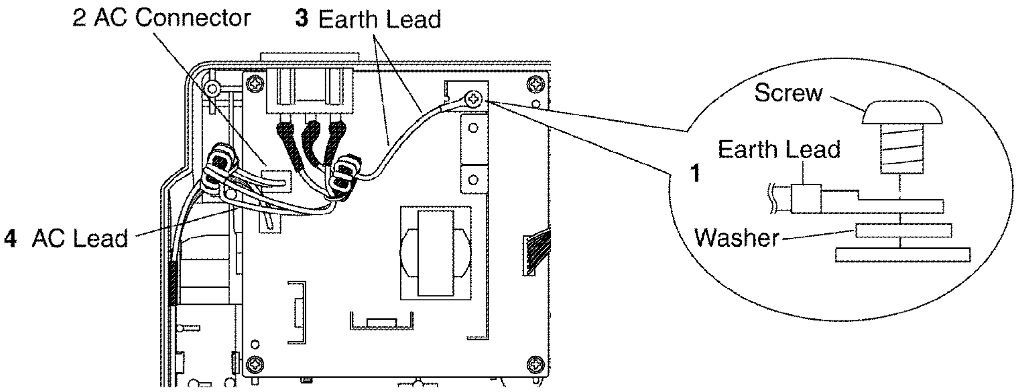
CAUTION

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose used batteries according to the manufacturerís instructions:
The lithium battery is a critical component (type No. CR-2032/V9A). Please observe for the proper polarity and exact location when replacing and soldering the replacement battery.

1.7. AC CAUTION

For safety, before closing the lower cabinet, please make sure of the following precautions.

1. **The earth lead is fixed with the screw.**
2. **The AC connector is connected properly.**
3. **Wind the earth lead around the core 4 times.**
4. **Wind the earth AC around the core 4 times.**



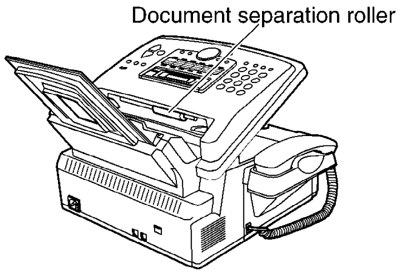
1.8. PERSONAL SAFETY PRECAUTIONS

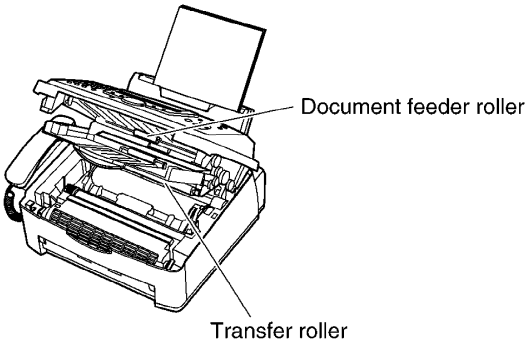
1.8.1. MOVING SECTIONS OF THE UNIT

Be careful not to let your hair, clothes, fingers, accessories, etc., become caught in any moving

sections of the unit.

The moving sections of the unit are the rollers and a gear. There is a separation roller and a document feed roller which are rotated by the document feed motor. A gear rotates the two rollers. Be careful not to touch them with your hands, especially when the unit is operating.



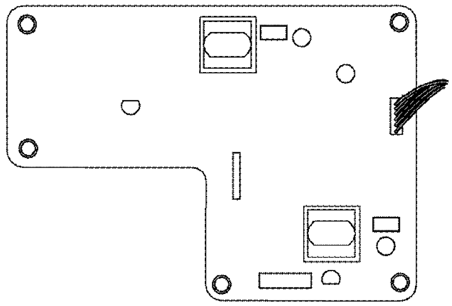


1.8.2. LIVE ELECTRICAL SECTIONS

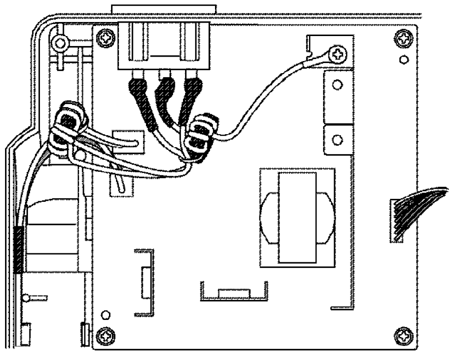
All the electrical sections of the unit supplied with AC power by the AC power cord are live. Never disassemble the unit for service with the AC power supply plugged in.

CAUTION:

AC voltage is supplied to the primary side of the power supply unit. Therefore, always unplug the AC power cord before disassembling for service.



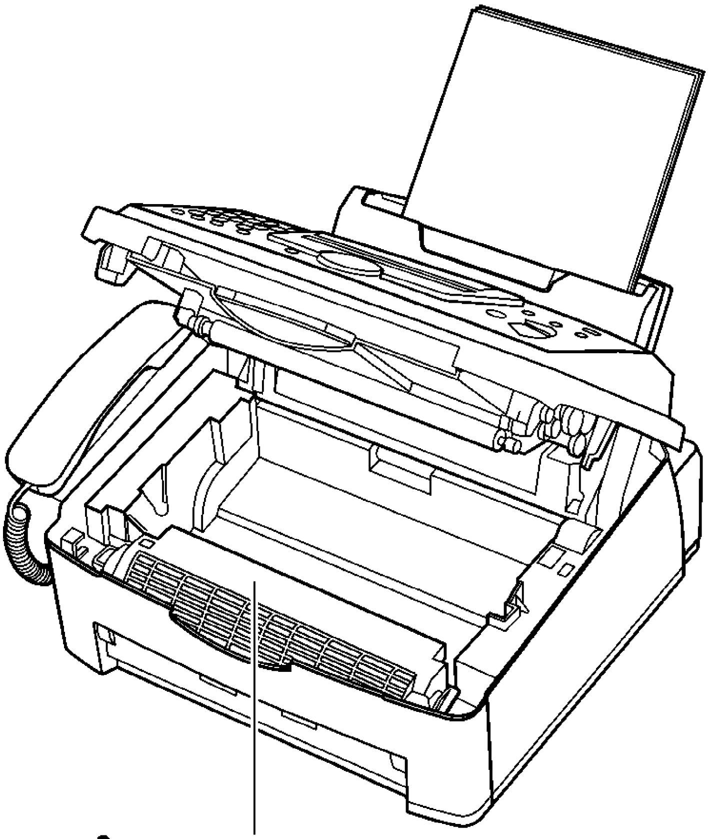
High Voltage power Supply board



Low Voltage power Supply board

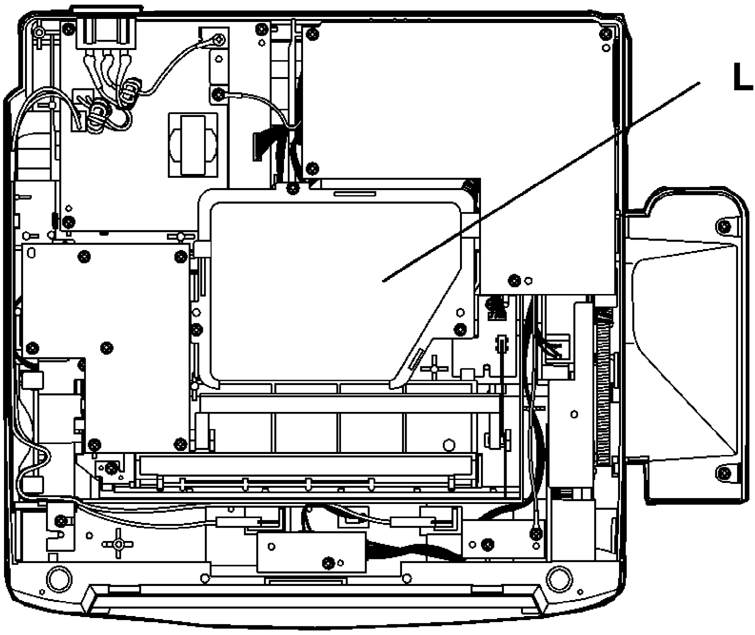
1.8.3. LASER BEAM AND FUSER UNIT SECTION

- **The printer of this unit utilizes a laser. Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.**
- **The fuser unit is inside of the unit and gets hot. Do not touch it when removing the jammed paper or cleaning the lower glass.**



Fuser unit

The fuser unit gets hot. Do not touch it.

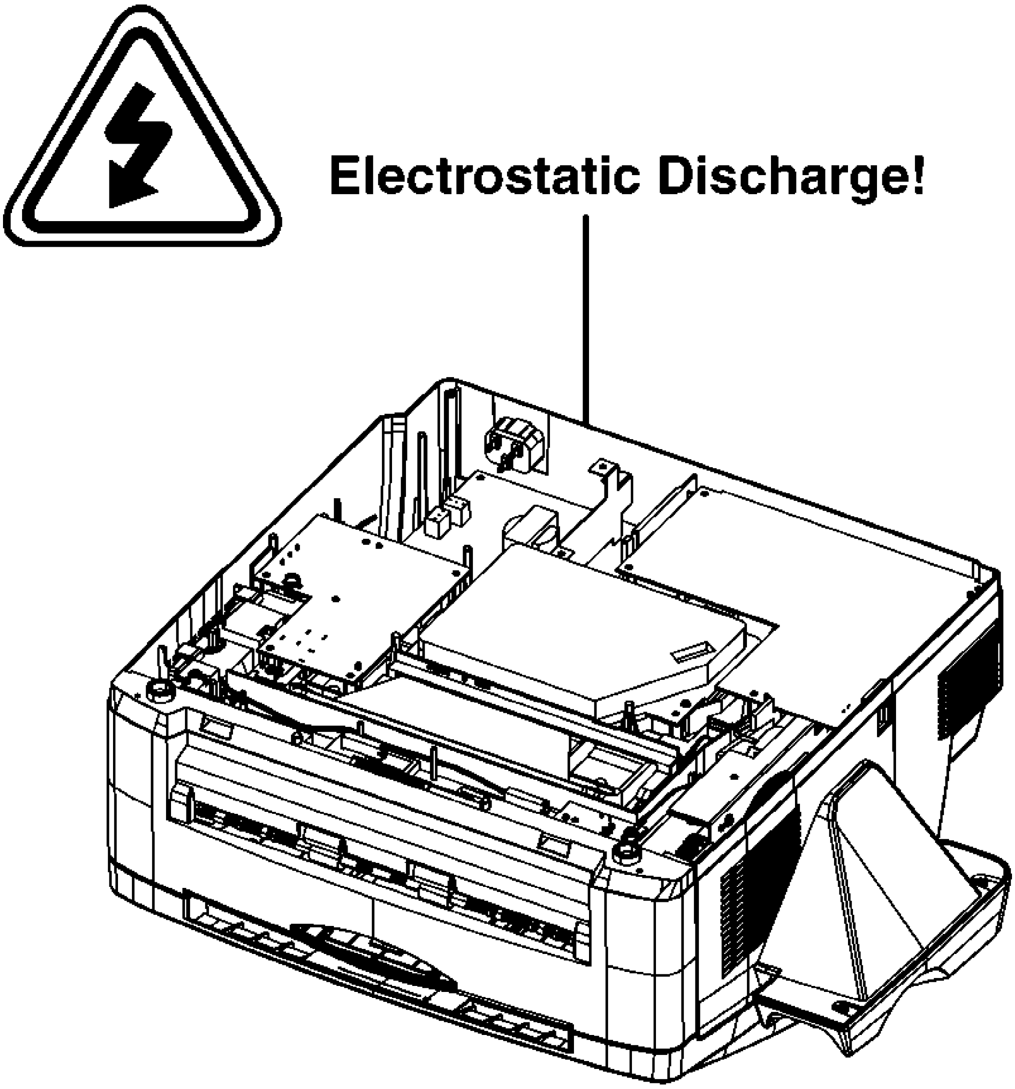


(BOTTOM VIEW)

1.9. SERVICE PRECAUTIONS

1.9.1. PRECAUTIONS TO PREVENT DAMAGE FROM STATIC ELECTRICITY

Electrical charges accumulate on a person. For instance, clothes rubbing together can damage electric elements or change their electrical characteristics. In order to prevent static electricity, touch a metallic part that is grounded to release the static electricity. Never touch the electrical sections such as the power supply unit, etc.



1.10. FOR BEST PERFORMANCE

- **To extend the life of the drum unit, the unit should never be turned OFF immediately after printing. Leave the power turned ON for a minimum of 30 minutes after printing.**
- **In the printing process, heat is used to fuse toner onto the page. As a result, it is normal for the machine to produce an odor during and shortly after printing. Be sure to use this unit in an area with proper ventilation.**

- Do not cover slots or openings on the unit. Inspect the air circulation vents regularly and remove any dust build-up with a vacuum cleaner.
- If the inside of the unit is dirty, clean it with a soft and dry cloth (especially the lower glass).
- When replacing the toner cartridge or drum unit, do not allow dust, water, or liquids to come in contact with the drum. This may affect print quality.
- Store unused paper in the original packaging, in a cool and dry place. Not doing so may affect print quality.
- Do not place the unit in an area where the paper tray may be obstructed (i.e., by a wall,etc.).
- Keep the air circulation vents away from walls etc.more than 50 mm (1 31 / ") to let the unit cool down.

2. FEATURES AND SPECIFICATIONS

2.1. FEATURES

General

- Help function
  Display:
  1. BASIC SETTINGS
  2. FEATURE LIST
  3. DIRECTORY
  4. FAX RECEIVING
  5. COPIER
  6. REPORTS
  7. CALLER ID
- LCD (Liquid Crystal Display) readout
- TAM (Telephone answering machine) interface

Plain Paper Facsimile Machine

- Letter/A4/Legal, G3 compatible
- Automatic document feeder (20 sheets)
- Quick scan
- Resolution: Standard/Fine/Super fine/Photo/Photo with text. (64 level)
- STANDARD: For printed or typewritten originals with normal-sized characters.

- **FINE: For originals with small printing.**
- **SUPER FINE: For originals with very small printing.**
- **PHOTO: For originals containing photographs, shaded drawing,etc.**
- **PHOTO WITH TEXT: For originals containing photograph and text.**
- **Broad cast**
- **220-sheet paper capacity (60 g/m2~ 75 g/m2[16 lb~20 lb.])**
- **Distinctive ring detection.**

Large Memory... Performed by DRAM
Approx. 120 pages of memory transmission
Approx. 170 pages of memory reception

Integrated Telephone System

- **On-hook dialing**
- **Monitor speaker**
- **Voice muting**
- **Redialing function**
- **122-Station telephone directory**

Enhanced Copier Function

- **Multi-copy function (up to 99 copies)**
- **Enlargement and reduction**
- **Collate**
- **64-Level halftone**

2.2. SPECIFICATIONS

Applicable Lines:

Public Switched Telephone Network

Document Size:

Max. 216 mm (8 1/2”) in width
Max. 600 mm (23 5/8”) in length

Effective Scanning Width:

208 mm (8 3/16”)

Effective Printing Width:

A4 : 202mm
Letter/Legal : 208mm

Transmission Time*:

Approx. 8 s/page (ECM-MMR Memory transmission)**

Scanning Density:

Horizontal:
8 pels/mm (203 pels/inch)
Vertical:
3.85 lines/mm (98 lines/inch)-STANDARD
7.7 lines/mm (196 lines/inch)-FINE/PHOTO/PHOTO WITH TEXT
15.4 lines/mm (392 lines/inch)-SUPER FINE

Halftone Level:

64-level

Scanner Type:

Contact Image Sensor (CIS)

Printer Type:

Laser printer

Data Compression System:

Modified Huffman (MH), Modified READ (MR), Modified, Modified READ (MMR)

Modem Speed:

14,400/12,000/9,600/7,200/4,800/2,400 bps; Automatic Fallback

Operating Environment:

10°C—32.5°C (50°F—90.5°F), 20—80% RH (Relative Humidity)

Dimensions (H×W×D):

220 mm × 430 mm × 360 mm (8 21/32”×16 15/16”×14 5/32”)

Mass (Weight):

Approx. 9 kg (19.8 lb.)

Power Consumption:

Standby: Approx. 4 W
Transmission: Approx. 12W
Reception: Approx. 290 W
Copy: Approx. 290 W
Maximum: Approx. 950W (When the fuser lamp turns on)

Power Supply:

220-240 V AC, 50/60Hz

Memory Capacity:

Approx. 120 pages of memory transmission.
Approx. 170 pages of memory reception.
(Based on ITU-T No. 1 Test Chart in standard resolution.)

Laser diode properties:

Laser output: Max. 5 mW
Wave length: 760 nm—800 nm
Emission duration: Continuous

Print Speed:

12 ppm (page per minute)

Printing Resolution:

600 × 600 dpi

* Transmission speed depends upon the contents of the pages, resolution, telephone line conditions and capability of the other party’s machine.

** Transmission speed is based upon the ITU-T No. 1 Test Chart and original mode. (Refer to ITU-T No.1 TEST CHART().) If the capability of the other party's machine is inferior to your unit, the transmission time may be longer.

Note:

- Any details given in these instructions are subject to change without notice.
- The pictures and illustrations in these instructions may vary slightly from the actual product.

Design and specifications are subject to change without notice.

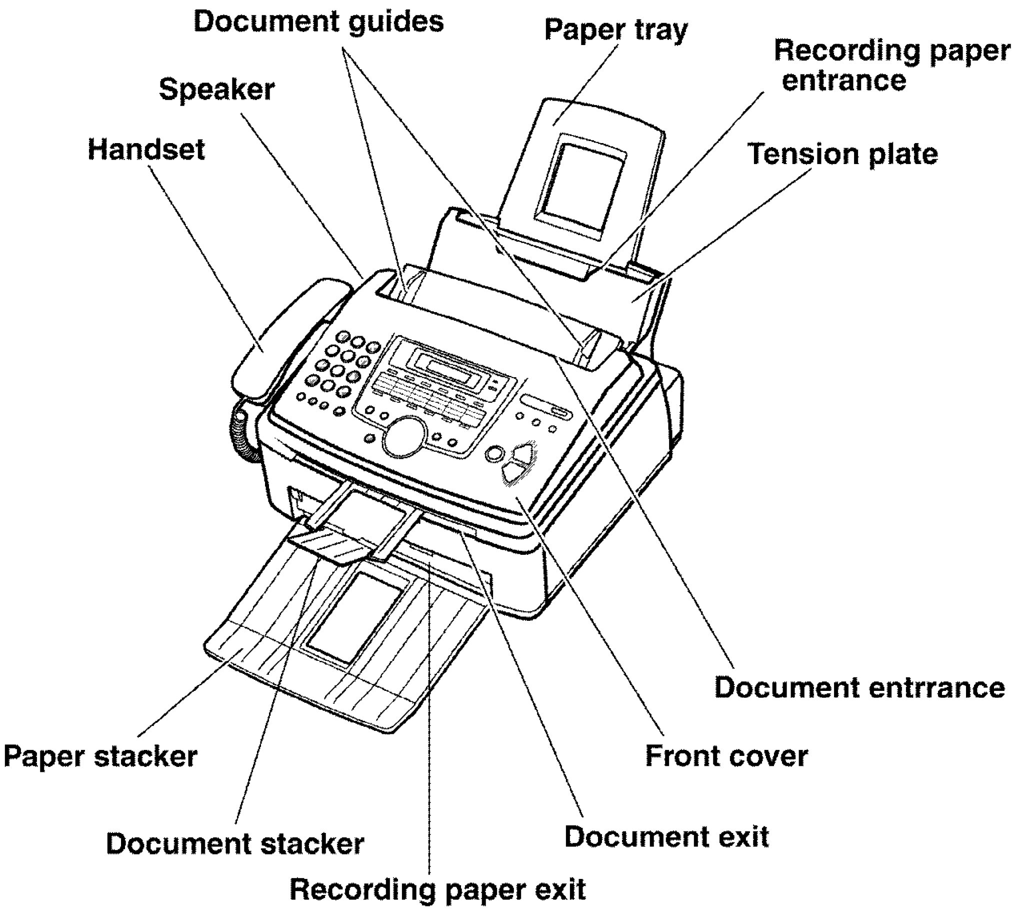
2.3. OPTIONAL ACCESSORIES

Model No.	Description	Specifications
KX-FA83E or KX-FA83A	Toner cartridge	1 toner cartridge
KX-FA84E or KX-FA84A	Drum unit	1 drum unit

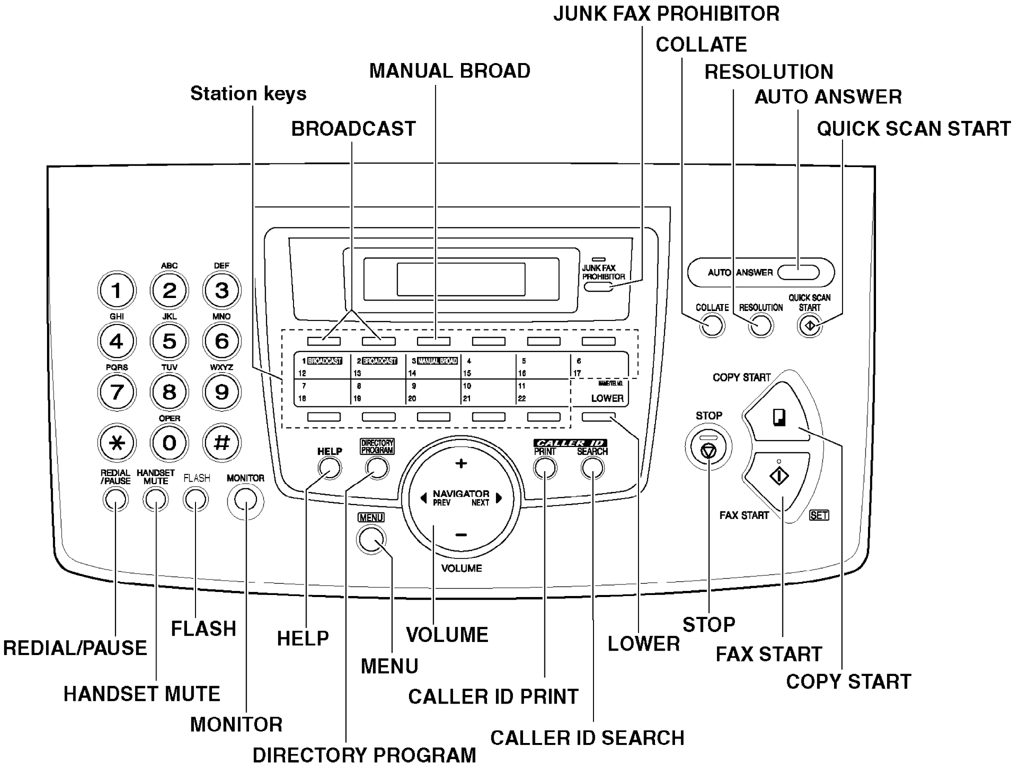
3. INSTALLATION

3.1. LOCATION OF CONTROLS

3.1.1. OVERVIEW


Document guides
Paper tray
Recording paper entrance
Speaker
Handset
Tension plate
Document entrrance
Front cover
Paper stacker
Document stacker
Document exit
Recording paper exit

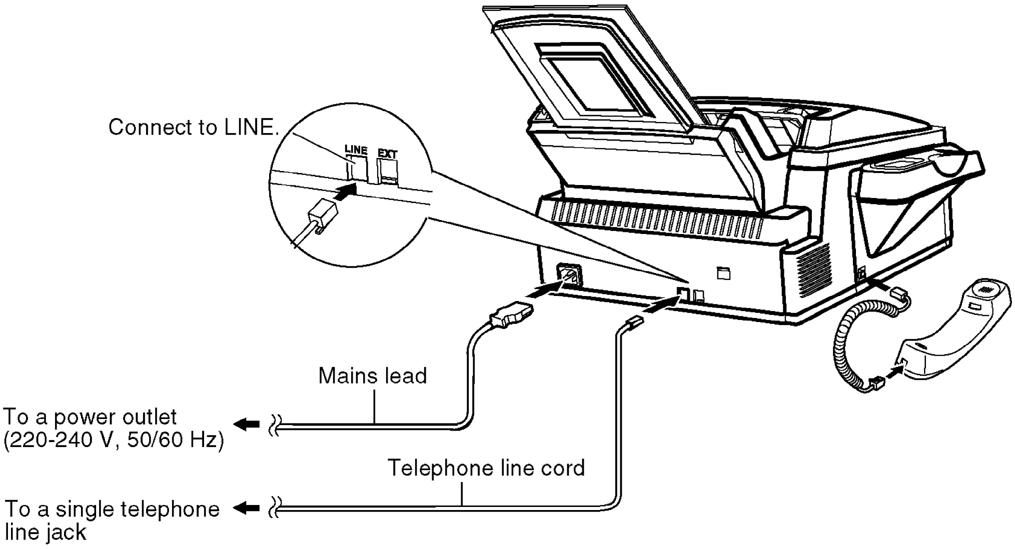
3.1.2. CONTROL PANEL


JUNK FAX PROHIBITOR
COLLATE
RESOLUTION
AUTO ANSWER
QUICK SCAN START
MANUAL BROAD
Station keys
BROADCAST
REDIAL/PAUSE
HANDSET MUTE
FLASH
MONITOR
HELP
DIRECTORY PROGRAM
MENU
VOLUME
CALLER ID PRINT
CALLER ID SEARCH
LOWER
STOP
FAX START
COPY START
1
2 ABC
3 DEF
4 GHI
5 JKL
6 MNO
7 PQRS
8 TUV
9 WXYZ
*
0 OPER
#
NAVIGATOR
PREV
NEXT
+
-
SET

3.2. CONNECTIONS

(1) Connect the handset cord.
(2) Connect the telephone line cord.
(3) Connect the power cord.

- **When the power is turned on for the first time, the unit will print some basic information.**


Connect to LINE.
LINE
EXT
Mains lead
To a power outlet (220-240 V, 50/60 Hz)
Telephone line cord
To a single telephone line jack

Caution:

- **When you operate this product, the power outlet should be near the product and easily accessible.**
- **Be sure to use the telephone line cord included in this unit..**
- **Do not extend the telephone line cord.**

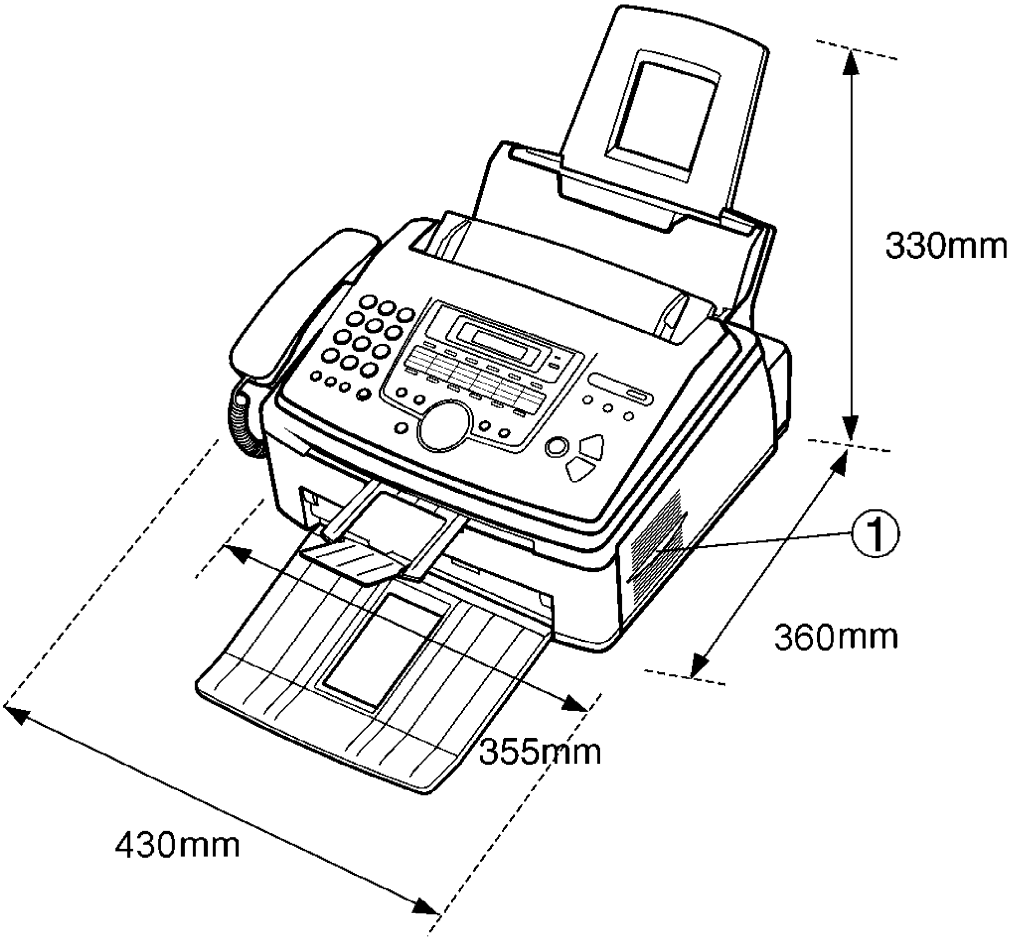
Note:

- **The warranty does not cover damage due to power line surges or lightning. For additional equipment protection, we recommend the use of a surge protector. The following types are available: TELESPIKE BLOK MODEL TSB (TRIPPE MFG. CO.), SPIKE BLOK MODEL SK6-0 (TRIPPE MFG. CO.), SUPER MAX (PANAMAX) or MP1 (ITW LINX).**
- **To avoid malfunction, do not position fax machine near appliances such as TVs or speakers which generate an intense magnetic field.**
- **If any other device is connected on the same line, this unit may disturb the network condition of the device.**

3.3. INSTALLATION

3.3.1. INSTALLATION SPACE

The space required to install the unit is shown below.
The dimensions given are necessary for the unit to operate efficiently.



Note:

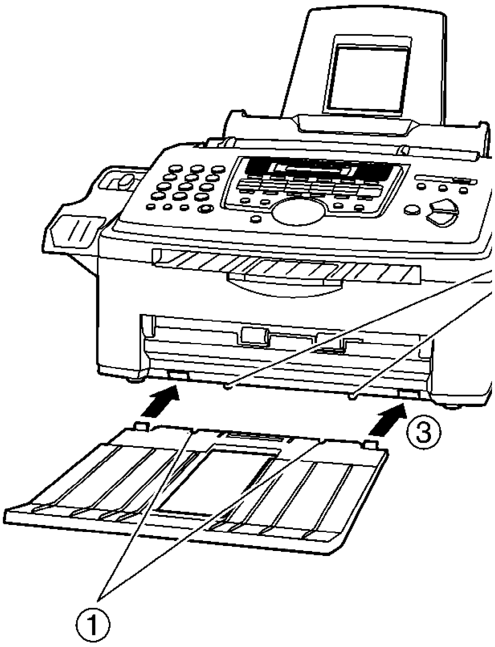
- **Avoid excessive heat or humidity.**
- **Use the unit within the following ranges of temperature and humidity.**
- **Ambient temperature: 10°C to 32.5°C**
- **Relative humidity: 20% to 80% (without condensation)**
- **Power cord length should be less than 5 meters (16.4 feet). Using a longer cord may reduce the voltage or cause malfunctions.**
- **Avoid direct sunlight.**
- **Do not install near devices which contain magnets or generate magnetic fields.**

- **Do not subject the unit to strong physical shock or vibration.**
- **Keep the unit clean. Dust accumulation can prevent the unit from functioning properly.**
- **To protect the unit from damage, hold both sides when you move it.**
- **Do not place the unit in an area where the paper tray may be obstructed (i.e., by a wall, etc.)**
- **Keep this surface (①) away from walls etc. more than 50 mm (1 31/32") to let the unit cool down.**

3.3.2. PAPER STACKER

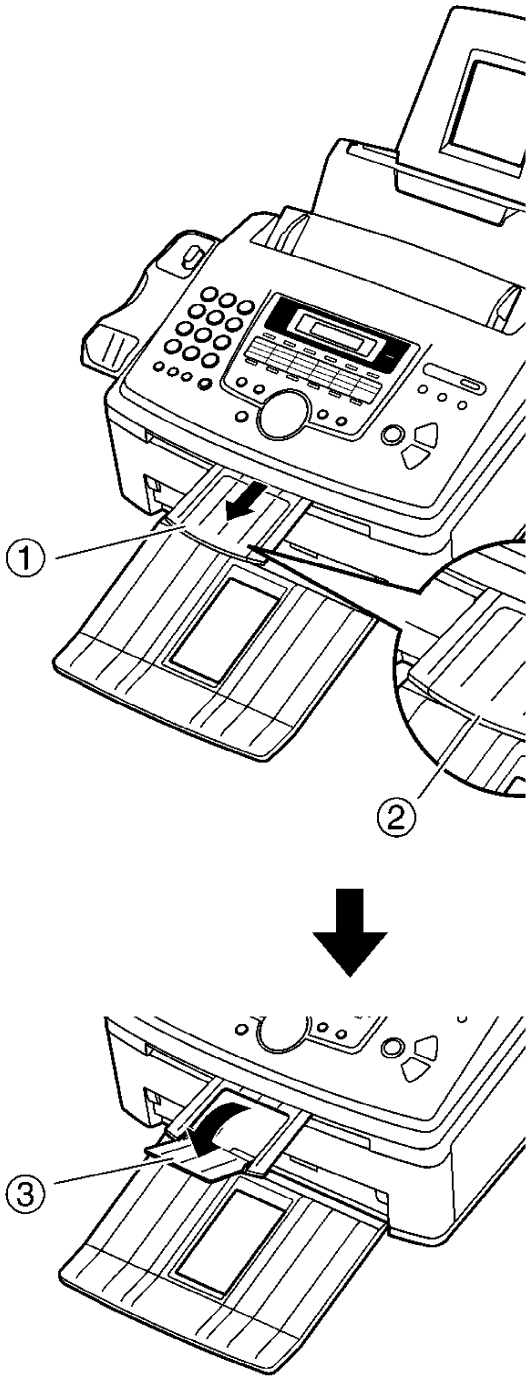
Line up the slots (①) in the paper stacker with the pegs (②) on the bottom of the unit, then insert the two tabs of the paper stacker into the slots on the unit (③).

-The paper stacker can hold up to approximately 100 sheets of printed paper. Remove the printed paper before the paper stacker becomes full.



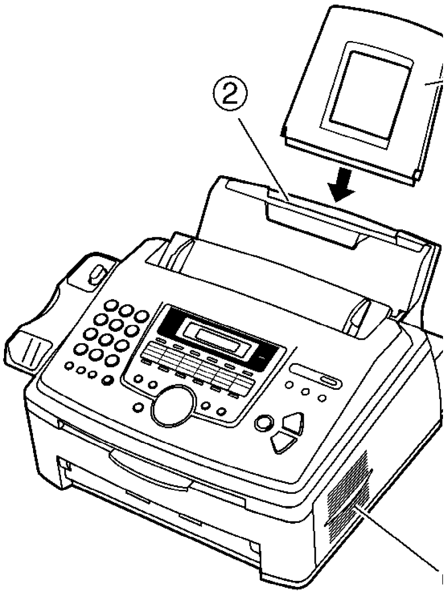
3.3.3. DOCUMENT STACKER

Pull the document stacker (①) forward gently until it clicks into place, then press the center part of the document stacker (②) to open the document stacker extender (③).



3.3.4. PAPER TRAY

Insert the paper tray (①) into the slot (②) on the back of the unit.



Note for installation:

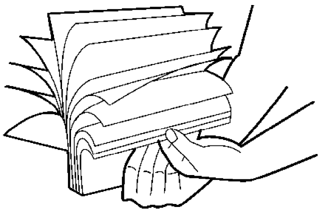
- Do not place the unit in an area where the paper tray may be obstructed (i.e. by a wall etc.).
- Document and recording paper will be ejected from the front of the unit. Do not place anything in front of the unit.
- Keep this surface (③) away from walls etc. more than 50 mm to let the unit cool down.

3.3.5. INSTALLING THE RECORDING PAPER

A4, Letter or legal size recording paper can be used for fax messages. The unit can hold up to 220 sheets of 60/75 g/m^2 to (16 lb. to 20 lb.) paper, 200 sheets of 80 g/m^2 (21 lb.) or 180 sheets of 90 g/m^2 (24 lb.) paper. See the note for paper specifications.

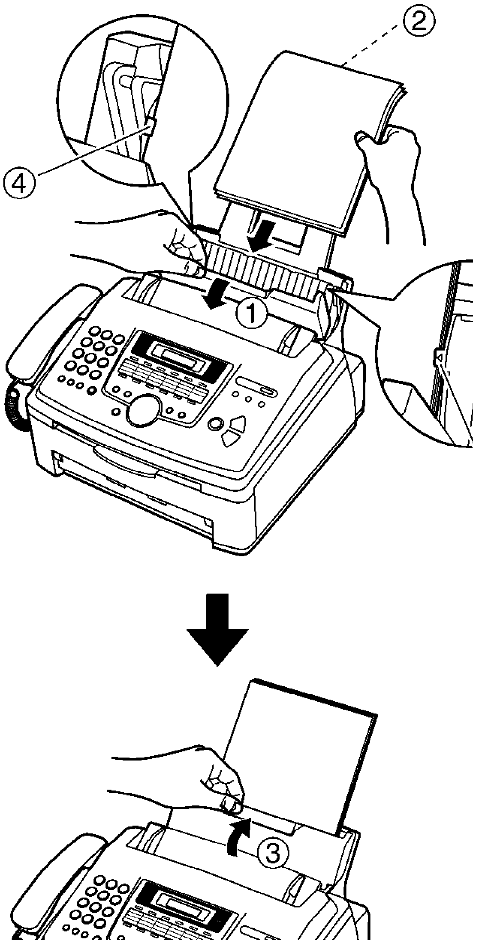
- The unit is set for A4 size paper by default. If you want to use legal or letter size paper, change the setting (feature #16).

1. Before inserting a stack of paper, fan the paper to prevent paper jams.



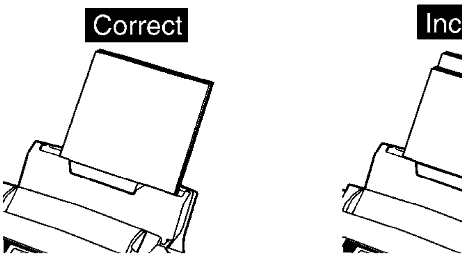
2. **Pull the tension plate forward (①) and insert the paper, print-side down (②), then push the tension plate (③) back.**

- **The paper should not be over the tabs (④)**
- **If the paper is not inserted correctly, readjust the paper, or the paper may be jam.**

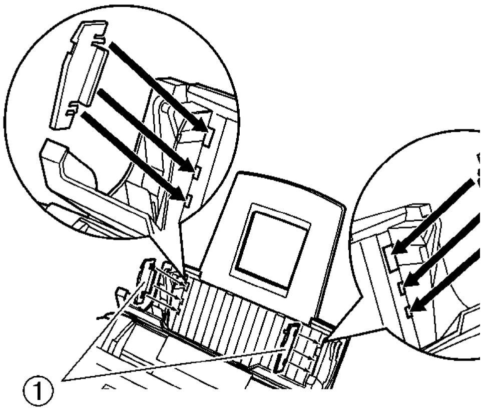


3. **To use A4 size paper**
You need to install the A4 paper guides.

Insert the tabs on the A4 paper guides (①) into the slots.

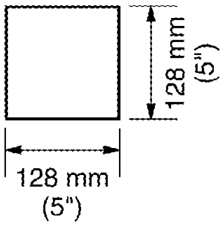


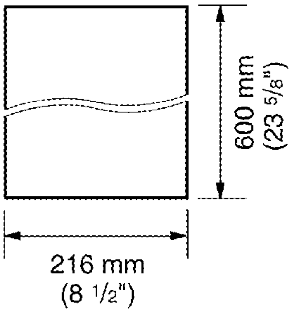
4. -“L” is shown on the A4 paper guide for the left side. “R” is shown on the A4 paper guide for the right side.

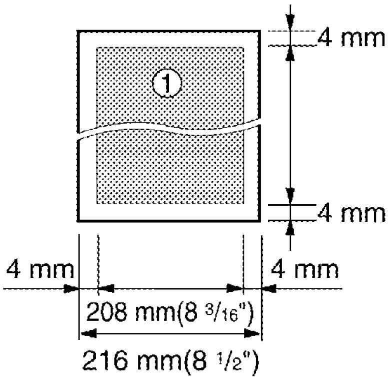


3.3.6. DOCUMENTS THE UNIT CAN SEND

3.3.6.1. USING THE ADF (AUTO DOCUMENT FEEDER)







Note:

- Remove chips, staples or other similar fasteners.
- Do not send the following types of documents. (Use copies for fax transmission.)
  — Chemically treated paper such as carbon or carbonless duplicating paper
  — Electrostatically charged paper
  — Badly curled, creased or torn paper
  — Paper with a coated surface
  — Paper with a faint image
  — Paper with printing on the opposite side that can be seen through the other side (i.e. newspaper)

Note for the auto document feeder and the scanner glass

- Check that ink, paste or correction fluid has dried completely.
- To transmit the document with a width of less than A4 size (210 mm), we recommend using a copy machine to copy the original

document onto letter-sized paper, then transmitting the copied document.

3.3.7. TO SELECT CHARACTERS WITH THE DIAL KEYPAD

Pressing the dial keys will select a character as shown below.

Keys	Characters
①	1 [ ] { } + - / = , . _ ` : ; ? |
②	A B C a b c 2
③	D E F d e f 3
④	G H I g h i 4
⑤	J K L j k l 5
⑥	M N O m n o 6
⑦	P Q R S p q r s 7
⑧	T U V t u v 8
⑨	W X Y Z w x y z 9
⓪	0 ( ) 〈 〉 ! " # $ % & ¥ ∗ @ ^ ' →
(#)	To change capital or lower case letter.
(FLASH)	**Hyphen** button (To insert a hyphen.)
(HANDSET MUTE)	**Insert** button (To insert one character or one space.)
(STOP)	**Delete** button (To delete a character.)
(▶)	▶ key (To move the cursor to the right.) To enter another character using the same number key, move the cursor to the next space.
(◀)	◀ key (To move the cursor to the left.)

3.3.8. TO SELECT CHARACTERS USING THE (+) OR (-) KEY

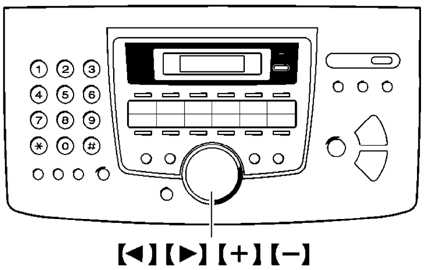
To select characters using (+) or (−)

Instead of pressing the dial keys, you can select characters using (+) or (−).

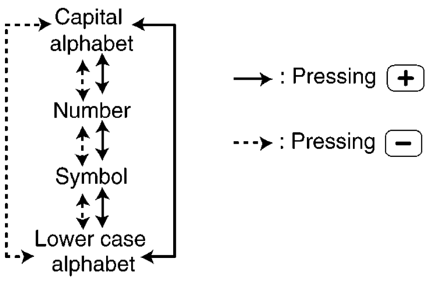
1. Press (+) or (−) repeatedly to display the desired character.

2. Press (▶) to move the cursor to the next space.
   - The character displayed in step 1 is inserted.

3. Return to step 1 to enter the next character.



Display order of characters



3.3.9. SETTING YOUR LOGO

The logo can be your company, division or name.

1 Press MENU.

Display:

```
SYSTEM SET UP
PRESS NAVI.[◄ ►]
```

2 Press ◀ or ▶ repeatedly to display the following.

```
YOUR LOGO
PRESS SET
```

3 Press SET.

- Cursor ( ) will disappear on the display.

```
LOGO=
```

4 Enter your logo, up to 30 characters, using the dial keypad. See the character table.

Example: "Bill"

1. Press 2 2 times.

Cursor

```
LOGO=B
```

2. Press 4 3 times.

```
LOGO=Bi
```

3. Press 5 3 times.

```
LOGO=Bil
```

4. Press ▶ to move the cursor to the next space and press 5 3 times.

```
LOGO=Bill
```

5 Press SET.

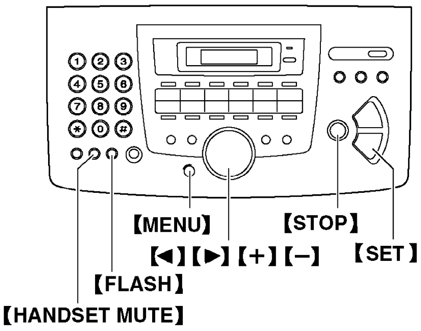
- The next feature will be displayed.

```
YOUR FAX NO.
      PRESS SET
```

6 Press MENU to exit the program.

Note:

- You can enter your logo by pressing + or − (see the next page) in step 4. In this case, press ▶ to move the cursor.



To change capital or lower case letters

Pressing the # key will change to capital or lower case alternatively.

1. Press 2 2 times.

Display:

```
LOGO=B
```

2. Press 4 3 times.

```
LOGO=BI
```

3. Press #.

```
LOGO=Bi
```

4. Press 5 3 times.

```
LOGO=Bil
```

To correct a mistake

- Press ◀ or ▶ to move the cursor to the incorrect character, and make the correction.

To delete a character

- Press ◀ or ▶ to move the cursor to the character you want to delete and press STOP (Delete).

To insert a character

1. Press ◀ or ▶ to move the cursor to the position to the right of where you want to insert the character.
2. Press HANDSET MUTE (Insert) to insert a space and enter the character.

3.3.10. REPLACING THE TONER CARTRIDGE AND THE DRUM UNIT

When the display shows the following, replace the toner cartridge.

Display:

```
TONER LOW
```

or

```
TONER EMPTY
```

We recommend you replace the drum unit every fourth time you replace the toner cartridge. To check the drum life and quality, please print the printer test list.

To ensure that the unit operates properly, we recommend the use of Panasonic toner cartridge (Model No. KX-FA83E or KX-FA83A) and drum unit (Model No. KX-FA84E or KX-FA84A).

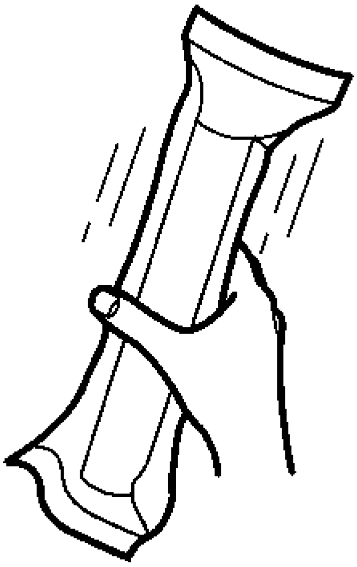
Caution:

- We cannot be responsible for any damage to the unit or

degradation of print quality which may occur from the use of non-Panasonic toner cartridge and drum unit.

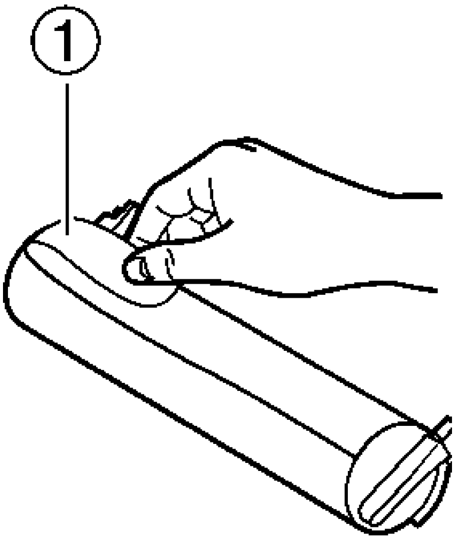
- The drum unit contains a photosensitive drum. Exposing it to light may damage the drum. Once you have opened the protection bag:
  - —Do not expose the drum unit to light for more than 5 minutes.
  - —Do not touch or scratch the green drum surface.
  - —Do not place the drum unit near dust or dirt, or in a high humidity area.
  - —Do not expose the drum unit to direct sunlight.
- Do not unplug the fax machine to prevent loss of fax documents in memory.
- Do not leave the toner cartridge out of the protection bag for a long time. It will decrease the toner life.
- Do not add toner to the toner cartridge.

1. Before opening the protection bag of the new toner cartridge, shake it vertically more than 5 times.

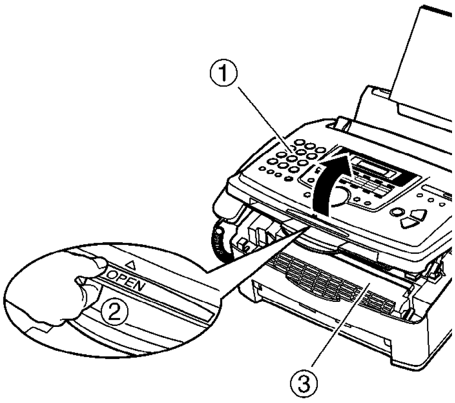


2. **Remove the new toner cartridge from the protection bag.**

   Peel off the seal (①) from the toner cartridge.



3. **Lift open the front cover (①), holding OPEN (②).**

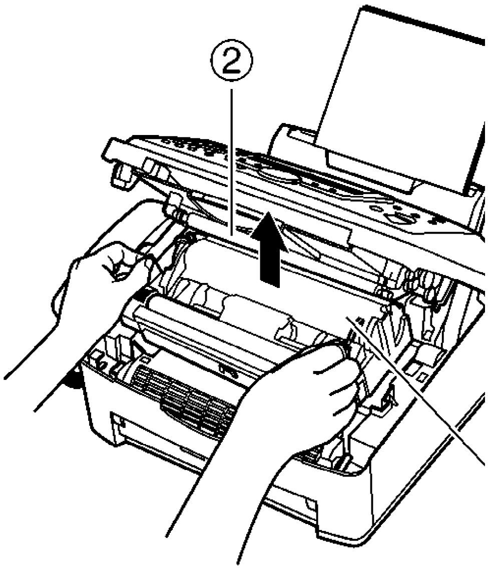


Caution:
The fuser unit (③) gets h
Do not touch it.

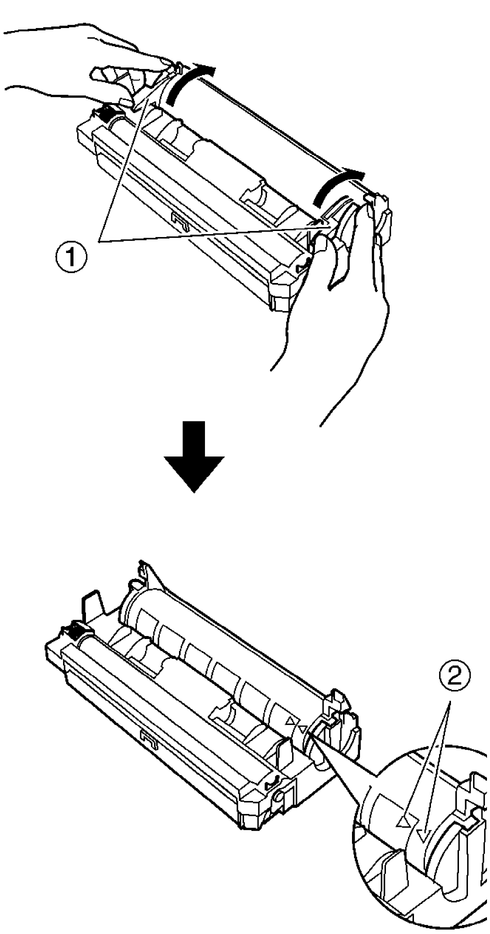
4. **Tap on the used toner cartridge several times to allow the remaining toner to fall into the drum unit.**

   Remove the drum and toner unit (①) by holding the two tabs.

   - **Do not touch the transfer roller (②).**
   - **If you replace the toner cartridge and the drum unit at the same time, skip to step 7.**

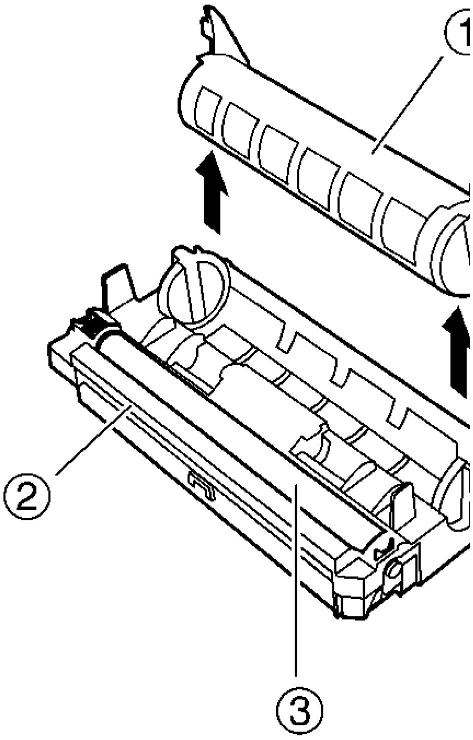


5. **Turn the two levers (①) on the used toner cartridge firmly, until the triangles (②) match.**



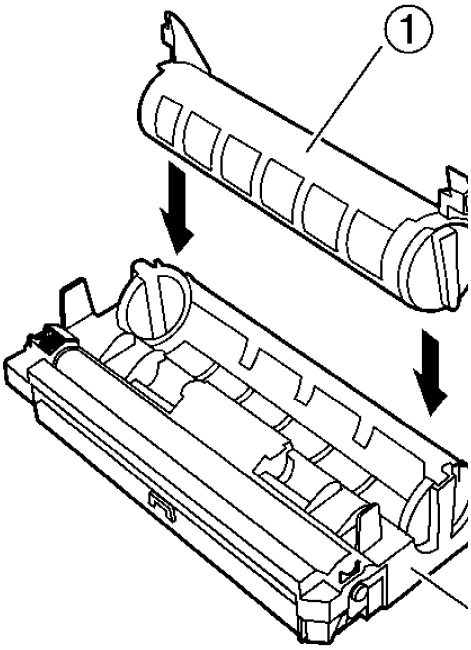
6. **Remove the used cartridge (①) from the drum unit (②).**

- **The toner may stick to the cartridge and the drum unit. Be careful when handling.**
- **Do not drop the toner on the green drum surface (③).**
- **Put the used toner cartridge into the protection bag.**

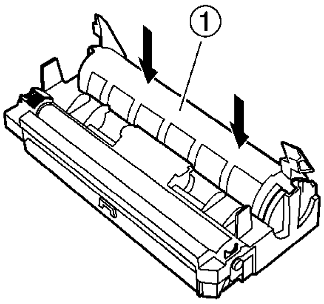


7. **If you replace the drum unit at the same time, remove the new drum unit from the protection bag.**

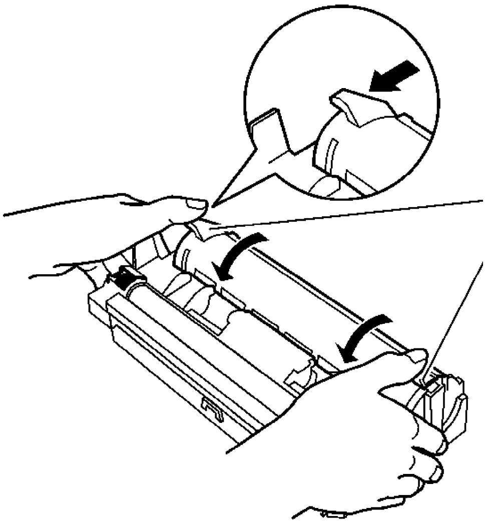
   Place the toner cartridge (①) into the drum unit (②) vertically.



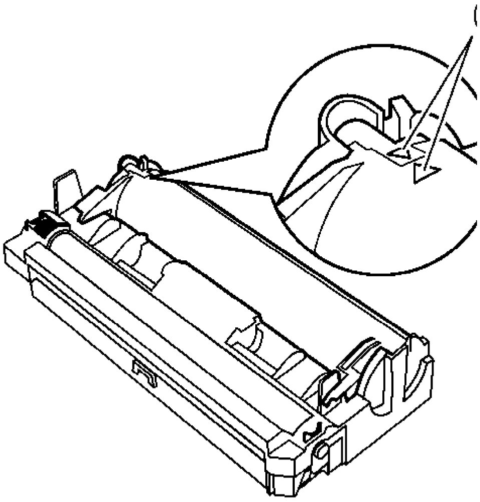
8. **Firmly press down the toner cartridge to snap into position (①).**



9. **Turn the two levers (①) on the toner cartridge firmly.**

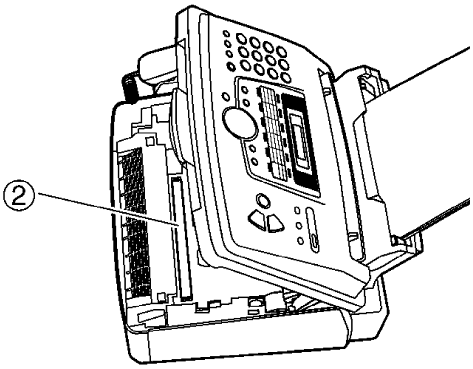


10. **Make sure that the triangles (①) match, to install the toner cartridge correctly.**



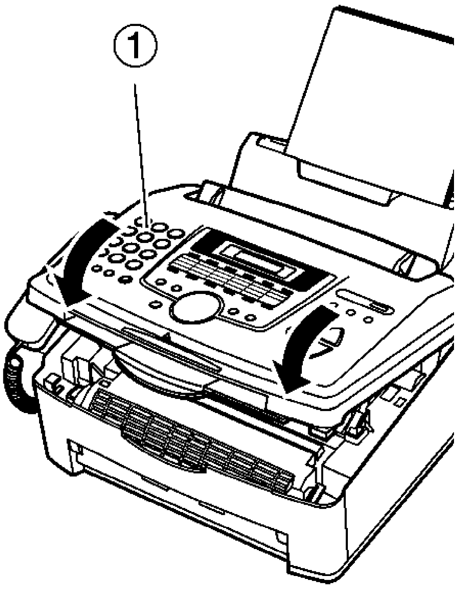
11. **Install the drum and toner unit (①) by holding the tabs.**

-If the lower glass (②) is dirty, clean it with a soft dry cloth.



12. **Close the front cover (①) by pushing down on both sides, until locked.**

-While the unit displays “PLEASE WAIT”, do not open the front cover, or disconnect the power cord.



4. MAINTENANCE

4.1. MAINTENANCE ITEMS AND COMPONENT LOCATIONS

4.1.1. OUTLINE

MAINTENANCE AND REPAIRS ARE PERFORMED USING THE FOLLOWING STEPS.

1. Periodic maintenance
Inspect the equipment periodically and if necessary, clean any contaminated parts.

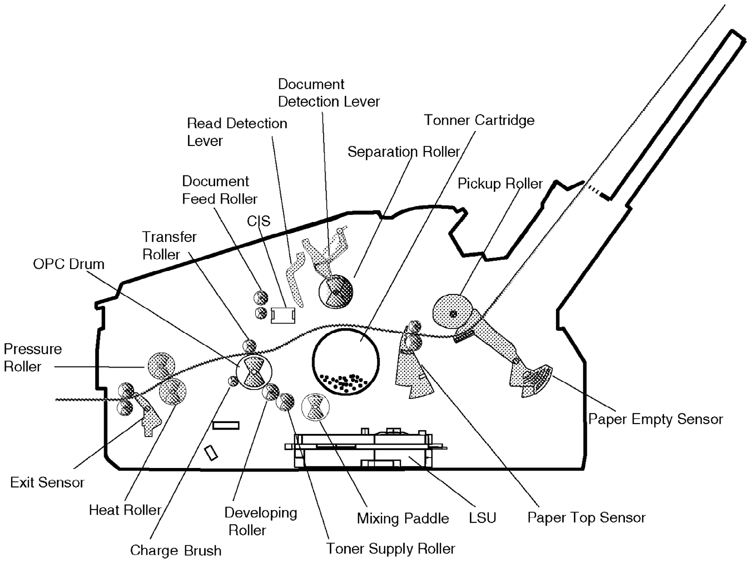
2. Check for breakdowns
Look for problems and consider how they arose.
If the equipment can be still used, perform copying, self testing or communication testing.

3. Check equipment
Perform copying, self testing and communication testing to

determine if the problem originates from the transmitter, receiver or the telephone line.

4. Determine causes
   Determine the causes of the equipment problem by troubleshooting.
5. Equipment repairs
   Repair or replace the defective parts and take appropriate measures at this stage to ensure that the problem will not recur.
6. Confirm normal operation of the equipment
   After completing the repairs, conduct copying, self testing and communication testing to confirm that the equipment operates normally.
7. Record keeping
   Make a record of the measures taken to rectify the problem for future reference.

4.1.2. MAINTENANCE CHECK ITEMS/COMPONENT LOCATIONS


Document Detection Lever
Read Detection Lever
Tonner Cartridge
Separation Roller
Document Feed Roller
Pickup Roller
CIS
Transfer Roller
OPC Drum
Pressure Roller
Paper Empty Sensor
Exit Sensor
Heat Roller
Developing Roller
Mixing Paddle
LSU
Paper Top Sensor
Charge Brush
Toner Supply Roller

4.1.2.1. Maintenance List

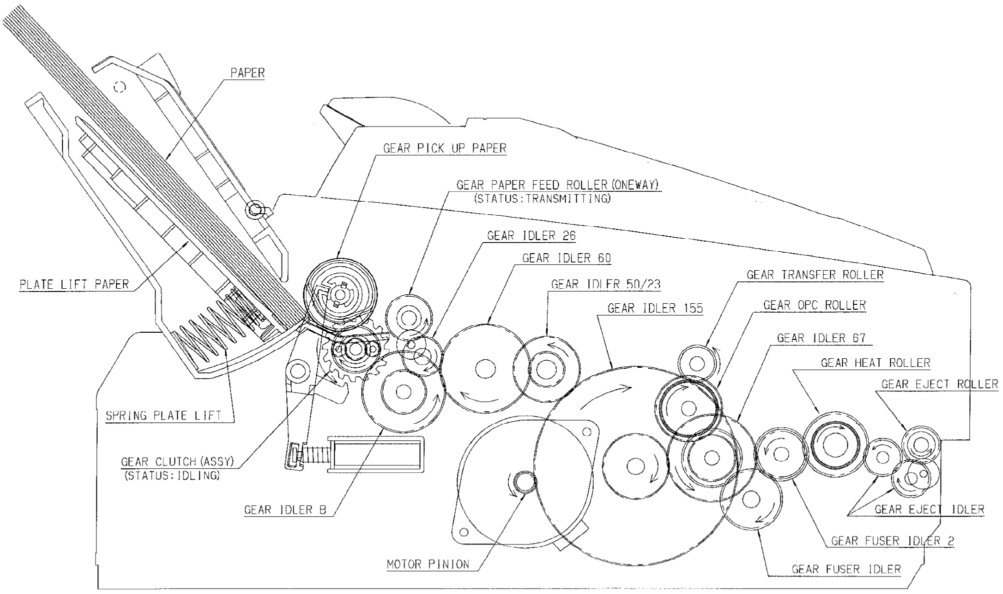
NO.	OPERATION	CHECK	REMARKS
1	Document Path	Remove any foreign matter such as paper.	—
2	Rollers	If the roller is dirty, clean it with a damp cloth then dry thoroughly.	Refer to MAINTENAN CHECK ITEMS/COMP LOCATIONS( ).()
3	Sensors	Document sensor (PS500), Paper feed sensor (PS501), Printer cover open switch (SW101),ADF cover open sensor (SW501), FB cover open sensor (SW500), ADF CIS position sensor (PS502),FB CIS position sensor (PS503)Resist sensor (PC201) ,Paper exit sensor (PS50). Paper sensor (PS1)Confirm the operation of the sensors.	See MAINTENANCE ITEMS/COMPONENT LOCATIONS() and SE AND SWITCHES SEC TEST FUNCTIONS()
4	Glass	If the glass is dirty, clean them with a dry soft cloth.	Refer to MAINTENAN
5	Abnormal, wear and tear or loose parts	Replace the part. Check if the screws are tight on all parts.	—

4.1.2.2. Maintenance Cycle

No.	Item	Cleaning Cycle	Replacement	
			Cycle	Proced
1	ADF Separation Roller (Ref.No.50)	3 months	7 years* (100,000 documents)	Refer to HOW REMOVE THE SEPARATION ().
2	Paper Feed Roller (Ref.No.154)	3 months	7 years (100,000 documents)	Refer to HOW REMOVE THE SEPARATION ().
3	ADF Separation Rubber (Ref. No.35)	3 months	7 years (100,000 documents)	Refer to HOW REMOVE THE SEPARATION ().
4	ADF Exit Roller (Ref.No.34)	3 months	7 years (100,000 documents)	Refer to HOW REMOVE THE SEPARATION ().
5	Pick up Roller (Ref No.108)	3 months	7 years (100,000 documents)	Refer to HOW REMOVE THE UNIT ().
6	Separation Rubber (Ref. No.99)	3 months	7 years (100,000 documents)	Refer to HOW REMOVE THE ROLLER ().
7	Document Feed Roller (Ref.No.154)	3 months	7 years (100,000 documents)	Refer to HOW TO REM SEPARATION

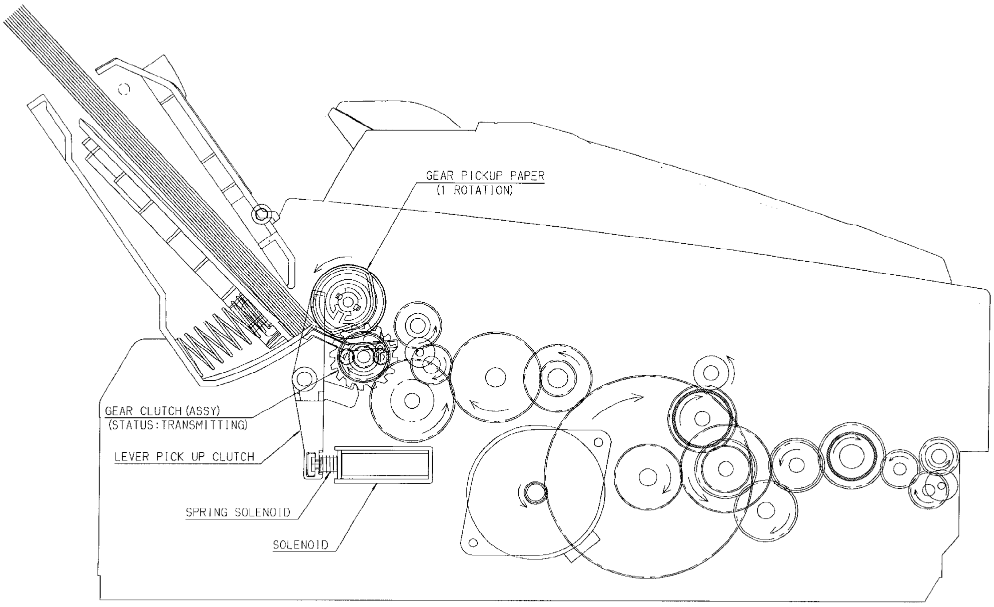
No.	Item	Cleaning Cycle	Replacement	
			Cycle	Proced
8	Transfer Roller (Ref.No.73)	3 months	7 years (100,000 documents)	Refer to HOW REMOVE THE TRANSFER R
9	Pressure Roller (Ref.No.120)	3 months	7 years (100,000 documents)	Refer to FUSE SECTION ().
10	Heat Roller (Ref.No.127)	3 months	7 years (100,000 documents)	Refer to FUSE SECTION ().
11	Exit Roller (Ref.No.142)	3 months	7 years (100,000 documents)	Refer to FUSE SECTION ().

4.2. PRINTING


PAPER
GEAR PICK UP PAPER
GEAR PAPER FEED ROLLER (ONEWAY)
(STATUS:TRANSMITTING)
GEAR IDLER 26
GEAR IDLER 60
GEAR IDLER 50/23
GEAR IDLER 155
GEAR TRANSFER ROLLER
GEAR OPC ROLLER
GEAR IDLER 67
GEAR HEAT ROLLER
GEAR EJECT ROLLER
PLATE LIFT PAPER
SPRING PLATE LIFT
GEAR CLUTCH (ASSY)
(STATUS: IDLING)
GEAR IDLER B
MOTOR PINION
GEAR EJECT IDLER
GEAR FUSER IDLER 2
GEAR FUSER IDLER

- The motor pinion rotates in the direction shown in the figure.
- The gears of fixing and developing parts are driven by the GEAR IDLER 67.
- The GEAR PAPER FEED ROLLER drives the roller.
- The GEAR CLUTCH runs idle and GEAR PICKUP PAPER is still.

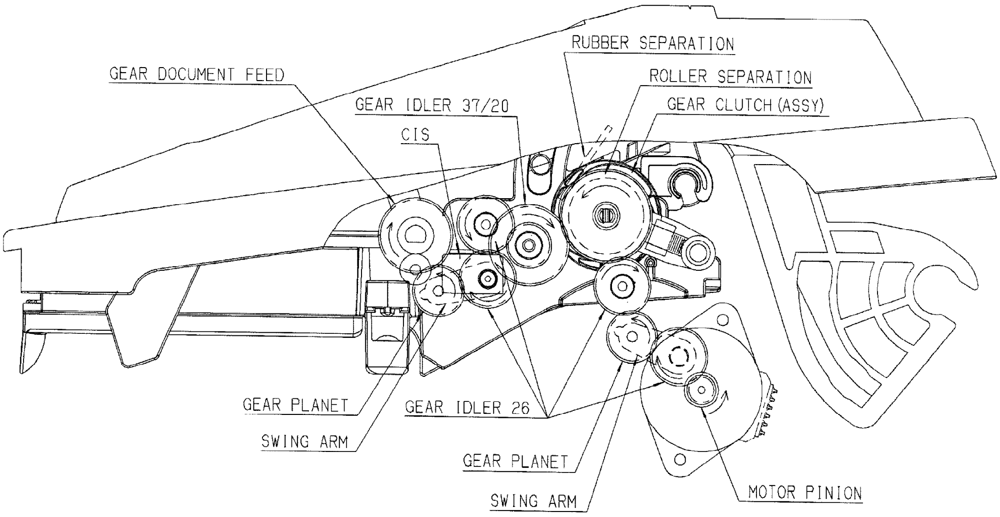
4.3. PRINTING (PAPER PICK UP)


GEAR PICKUP PAPER
(1 ROTATION)
GEAR CLUTCH (ASSY)
(STATUS:TRANSMITTING)
LEVER PICK UP CLUTCH
SPRING SOLENOID
SOLENOID

During printing

- When the SOLENOID is turned ON, the LEVER PICK UP CLUTCH is hooked on the RING of GEAR CLUTCH. It causes the GEAR PICKUP PAPER to rotate.
- The recording paper is pressed by the PICKUP ROLLER and the top paper is separated and fed.
- Even the SOLENOID is turned OFF, it can not stop on the way of a turn because the tip of LEVER PICK UP CLUTCH is on the CAM of GEAR PICKUP PAPER.
- When the tip of LEVER PICK UP CLUTCH returns to CAM's home position, the GEAR CLUTCH RING is unhooked, then the GEAR PICKUP PAPER is stopped.

4.4. SCANNING (ADF)


GEAR DOCUMENT FEED
RUBBER SEPARATION
ROLLER SEPARATION
GEAR CLUTCH (ASSY)
GEAR IDLER 37/20
CIS
GEAR PLANET
SWING ARM
GEAR IDLER 26
GEAR PLANET
SWING ARM
MOTOR PINION

- **DOCUMENT TRANSMISSION (ADF)**
  When the tip of the document is set to a point of contact between the separation roller and the separation pad through the document feed roller, then the document is fed there separately. The document feed roller carries the document and the CIS reads it through the glass. The document is exited through the document feed roller.

4.5. MAINTENANCE

If a black line, a white line or a dirty pattern appears on your recording paper, on your original, or on the fax document received by the other party, clean the white plate, scanner glass and lower glass.

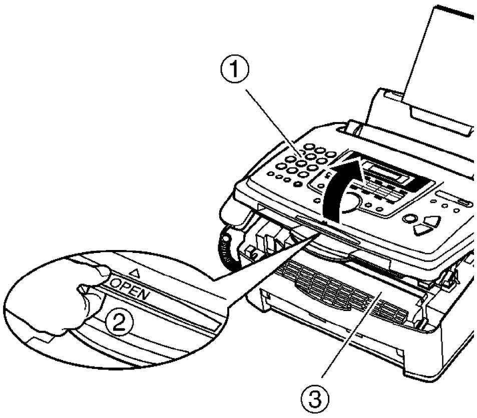
4.5.1. CLEANING THE INSIDE OF THE UNIT

If any of the following problems occurs, clean the inside of the unit:
— If misfeeding of your original occurs frequently.
— If a black line, a white or dirty pattern appears on your recording paper, on your original, or on the fax document received by the other party.
Caution:

- **Be careful when handling the toner and drum unit.**
- **Do not use paper products, such as paper towels or tissues, to clean inside of the unit.**

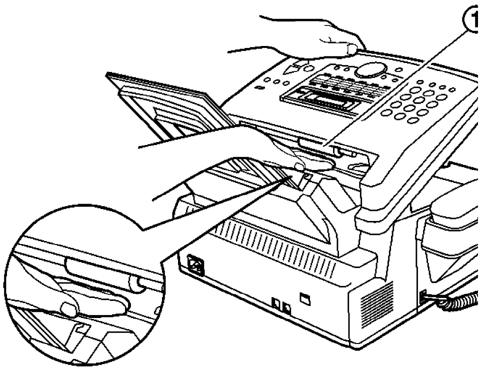
1. Disconnect the power cord and the telephone line cord.

2. Lift open the front cover (①) , holding OPEN (②).

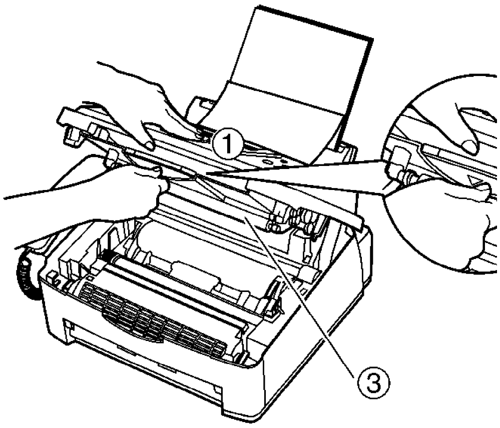


Caution:
The fuser unit (③) gets
Do not touch it.

3. Clean the document separation roller (①) with a cloth moistened with isopropyl rubbing alcohol, and let all parts dry thoroughly.

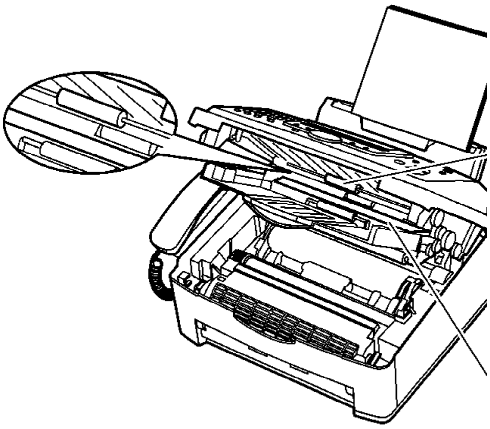


4. Hold the center part of the front cover (①), and pull open the inner cover (②).
   - Do not touch the transfer roller (③).



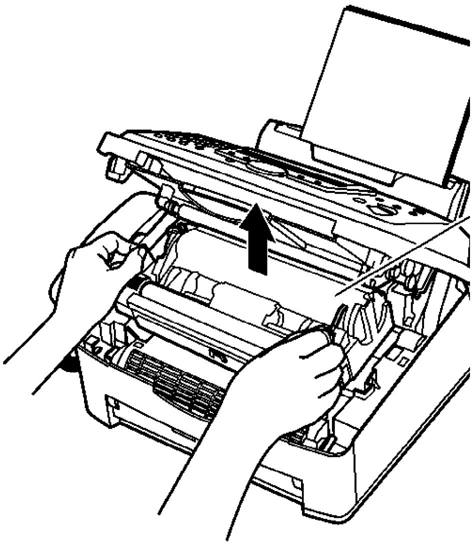
5. **Clean the document feeder roller (①) with a cloth moistened with isopropyl rubbing alcohol, and let all parts dry thoroughly.**

Clean the upper glass (②) with a soft and dry cloth.

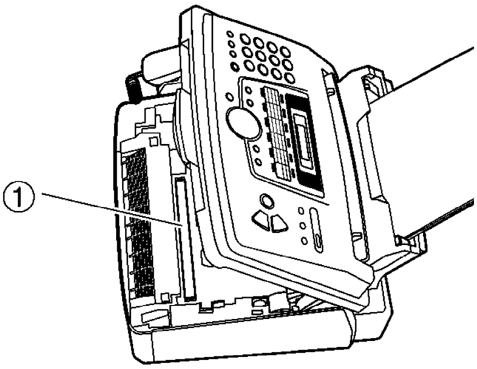


6. **Push back the inner cover.**

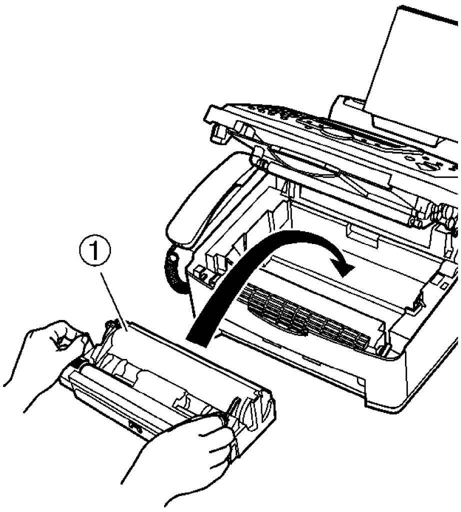
7. **Remove the drum and toner unit (①) by holding the two tabs.**



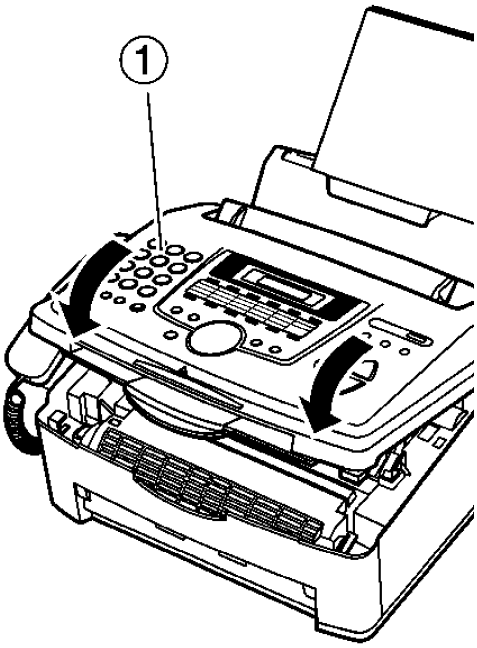
8. **Clean the lower glass (①) with a soft and dry cloth.**



9. **Reinstall the drum and toner unit (①) by holding the tabs.**



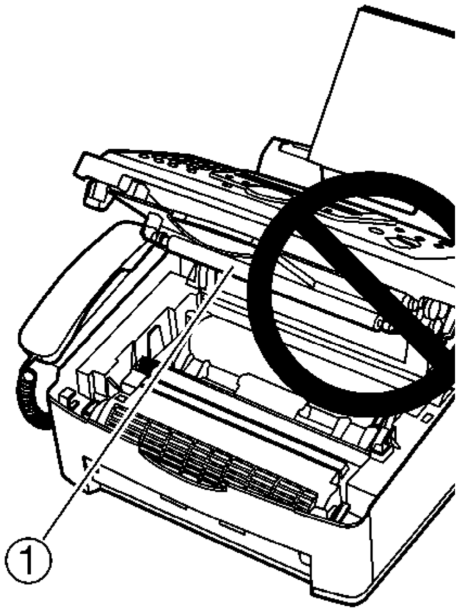
10. **Close the front cover (①) by pushing down on both sides, until locked.**



11. Reconnect the power cord and the telephone line cord.

Note:

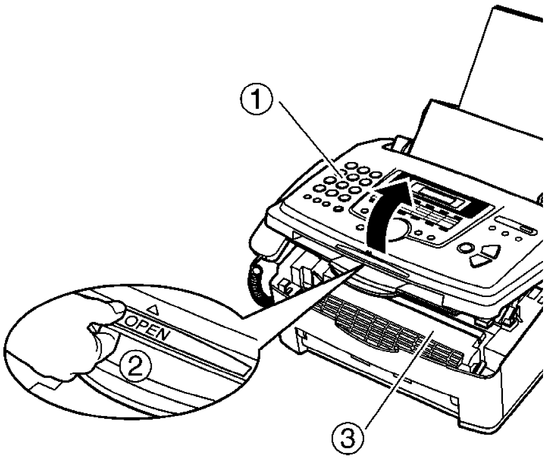
- Do not touch the transfer roller (①).



4.6. DOCUMENT JAMS

If the unit does not release the document during feeding, remove the jammed document as follows.

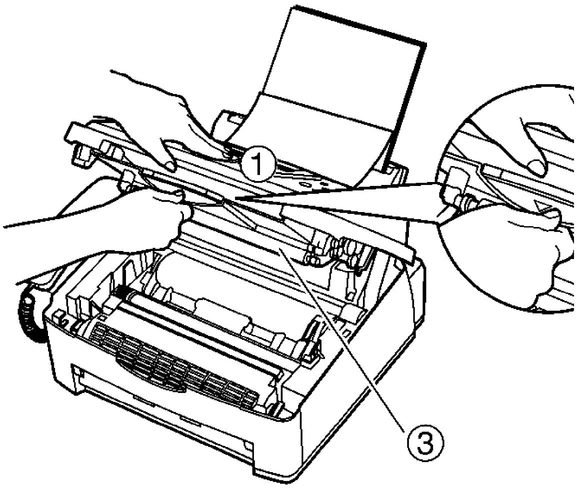
1. Lift open the front cover (①), holding OPEN (②).



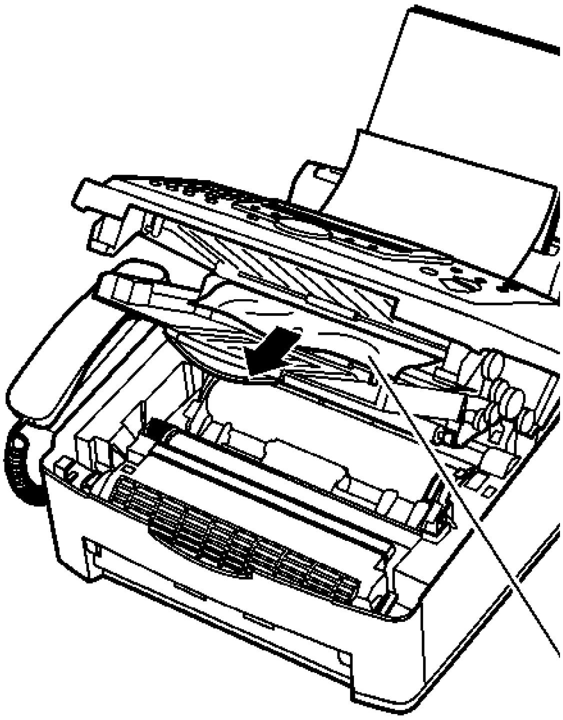
Caution:
The fuser unit (③) gets h
Do not touch it.

2. **Hold the center part of the front cover (①), and pull open the inner cover (②).**

   - **Do not touch the transfer roller (③).**

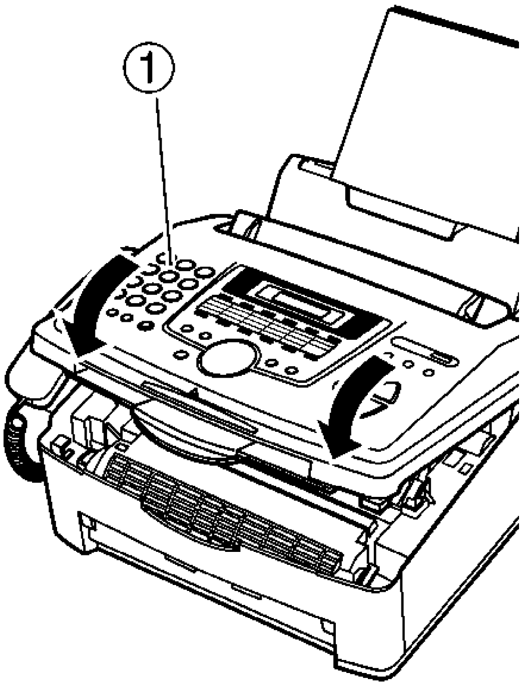


3. **Remove the jammed document carefully (①).**



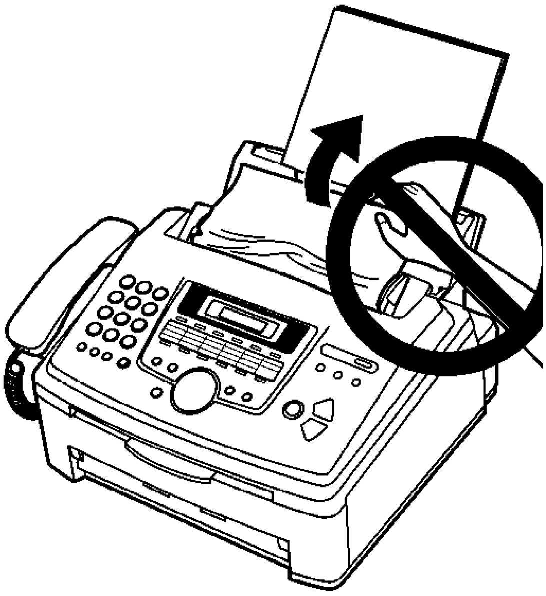
4. **Push back the inner cover.**

5. **Close the front cover (①) by pushing down on both sides, until locked.**



Note:

-Do not pull out the jammed document forcibly before opening the front cover.



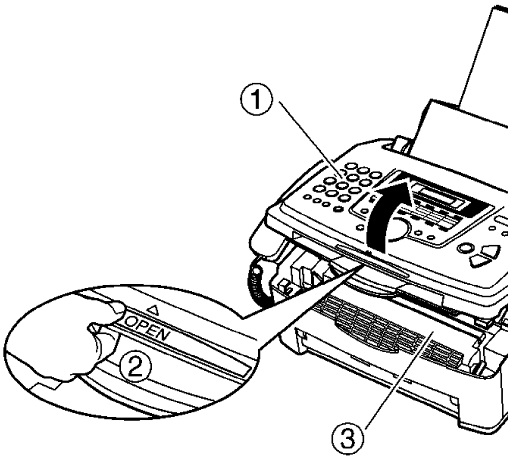
4.7. RECORDING PAPER JAMS

4.7.1. When the recording paper has jammed in the unit

If the unit does not eject any recording paper during reception or copying, the recording paper has jammed and the display will show the following massage.
The display will show the following.

Display: `PAPER JAMMED`

1. **Lift open the front cover (①), holding OPEN (②).**

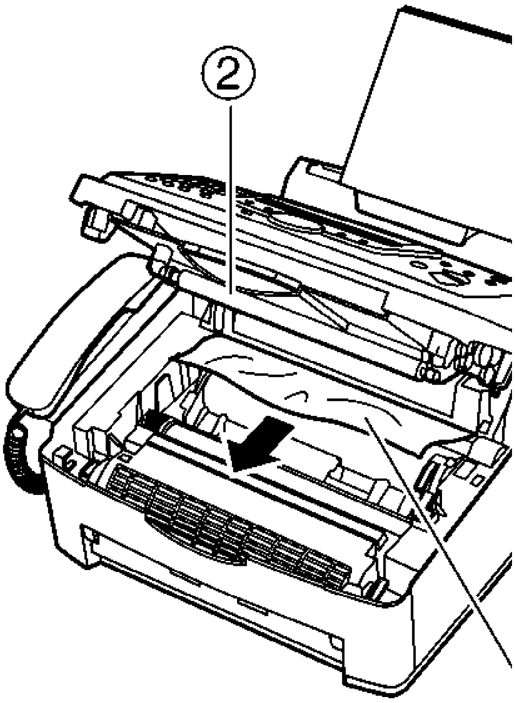


Caution:
The fuser unit (③) gets
Do not touch it.

2. **Remove the jammed paper.**
   When the recording paper has jammed near the drum and toner unit:

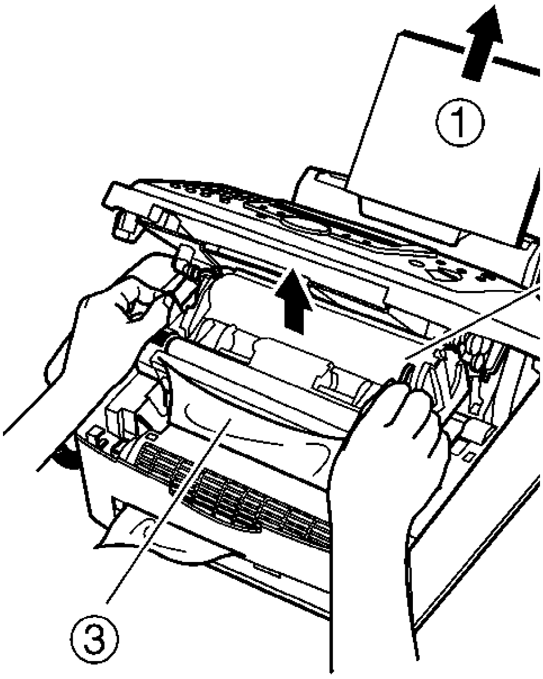
   Remove the jammed paper (①) carefully by pulling it toward you.

   - **Do not touch the transfer roller (②).**

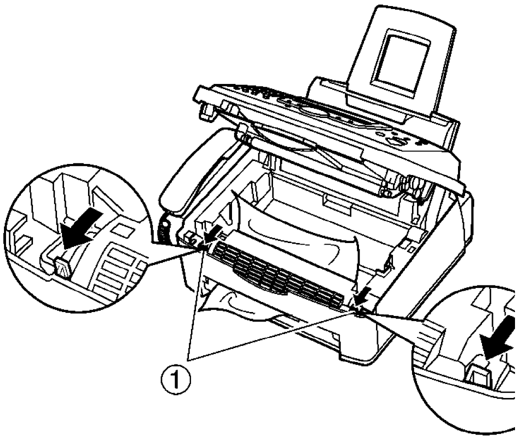


When the recording paper has jammed near the recording paper exit:

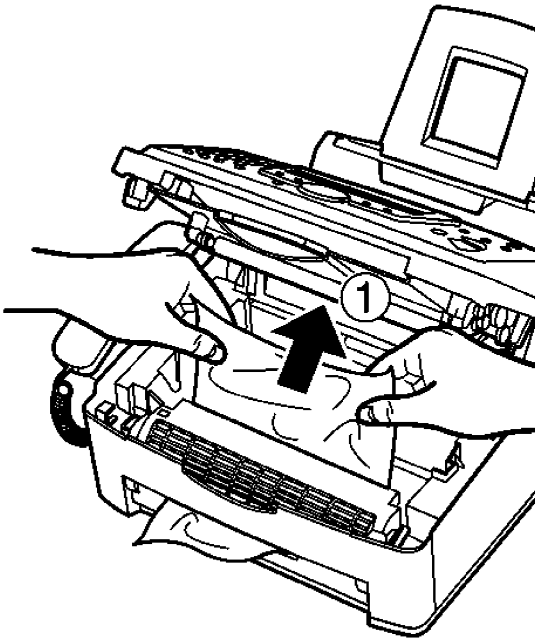
1. Remove the recording paper (①), then remove the drum and toner unit (②) to allow the jammed paper (③) to pull free from the rear cabinet.



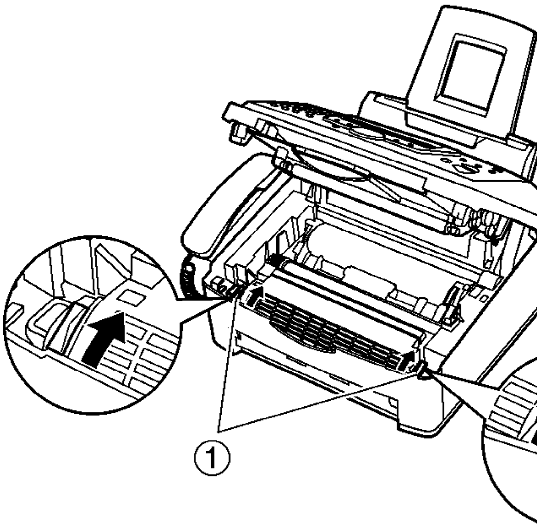
2. Lift both green levers (①) forward until they stop.



3. Remove the jammed paper (①) from the fuser unit by pulling it upwards carefully, then install the drum and toner unit.

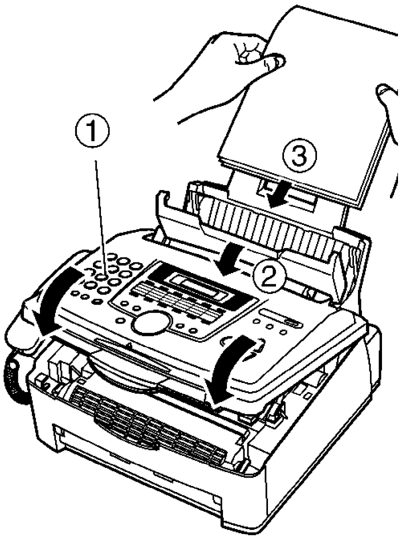


4. Push back the levers (①) to the original position.



3 **Close the front cover (①) by pushing down on both sides, until locked. Pull the tension plate forward (②) and re-insert the recording paper (③), then push back the tension plate.**

-Before re-inserting, make sure to fan and straighten the recording paper.



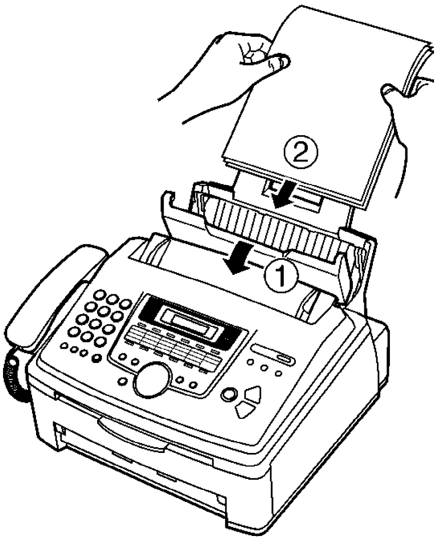
4.7.2. When the recording paper is not fed into the unit properly

The display will show the following.

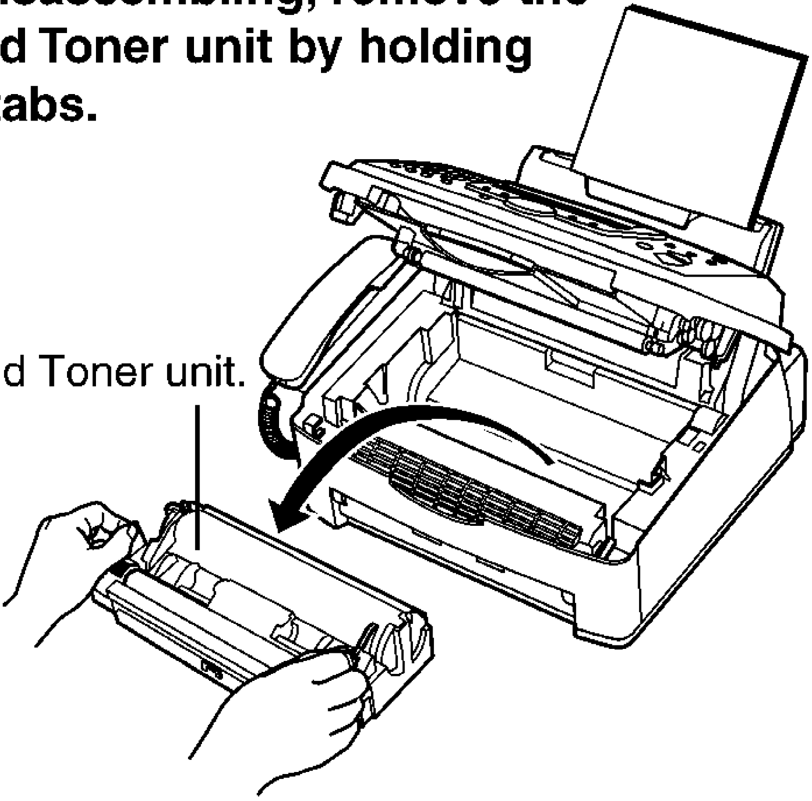
Display: `FAILED PICK UP`

1. **Remove the recording paper. Pull the tension plate forward (①) and re-insert the recording paper (②), then push back the tension plate.**

   -Before re-inserting, make sure to fan and straighten the recording paper.

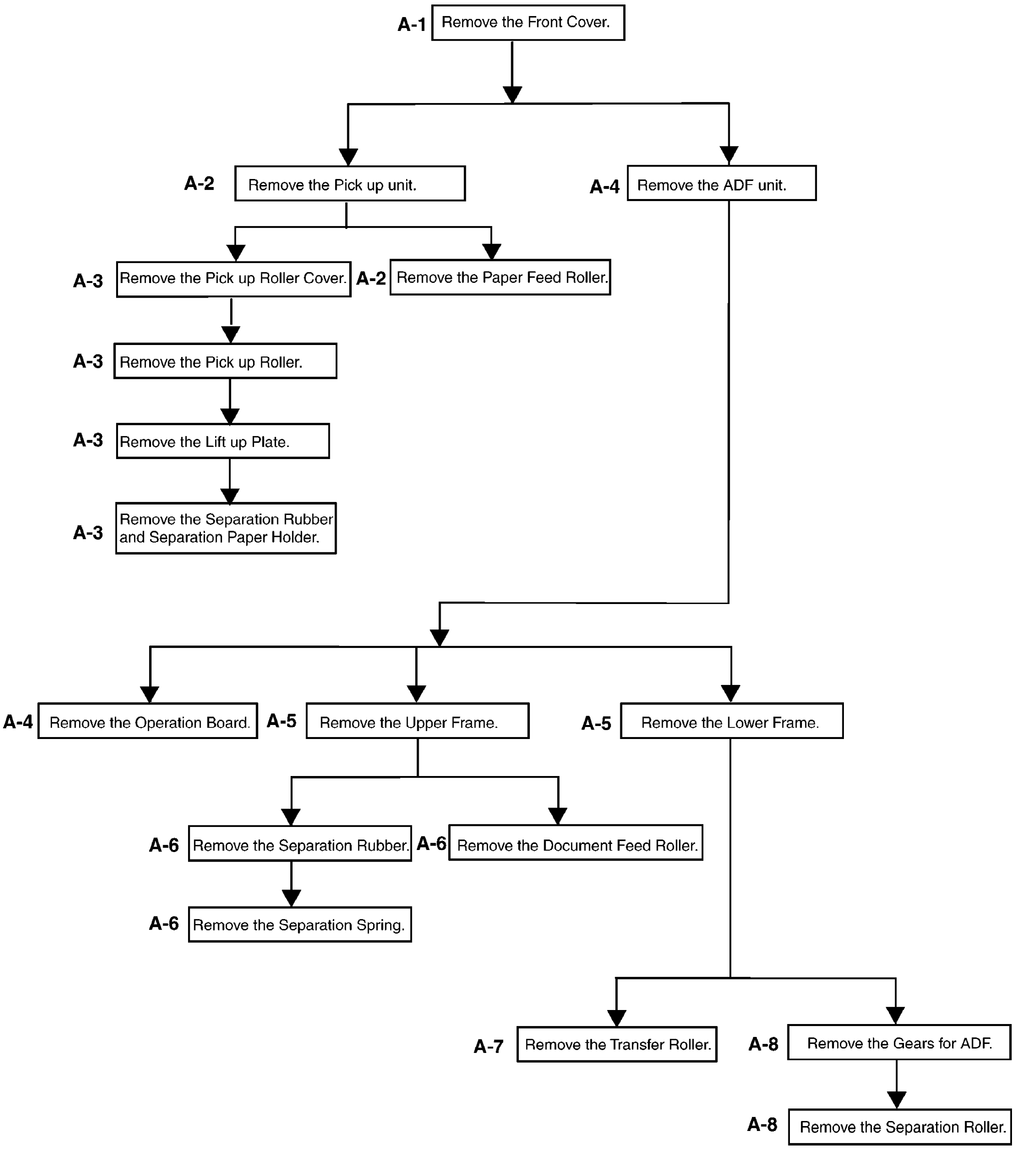


5. DISASSEMBLY INSTRUCTIONS


Drum and Toner unit.

Before disassembling, remove the Drum and Toner unit by holding the two tabs.

5.1. UPPER MAIN CABINET SECTION


A-1 Remove the Front Cover.
A-2 Remove the Pick up unit.
A-4 Remove the ADF unit.
A-3 Remove the Pick up Roller Cover.
A-2 Remove the Paper Feed Roller.
A-3 Remove the Pick up Roller.
A-3 Remove the Lift up Plate.
A-3 Remove the Separation Rubber and Separation Paper Holder.
A-4 Remove the Operation Board.
A-5 Remove the Upper Frame.
A-5 Remove the Lower Frame.
A-6 Remove the Separation Rubber.
A-6 Remove the Document Feed Roller.
A-6 Remove the Separation Spring.
A-7 Remove the Transfer Roller.
A-8 Remove the Gears for ADF.
A-8 Remove the Separation Roller.

CROSS REFERENCE:

A1: HOW TO REMOVE THE OPERATION PANEL ASS'Y ()

A2: HOW TO REMOVE THE PICK UP UNIT ()

A3: HOW TO REMOVE THE PICK UP ROLLER ()

A4: HOW TO REMOVE THE OPERATION BOARD ()

A5: HOW TO REMOVE THE LOWER FLAME ()

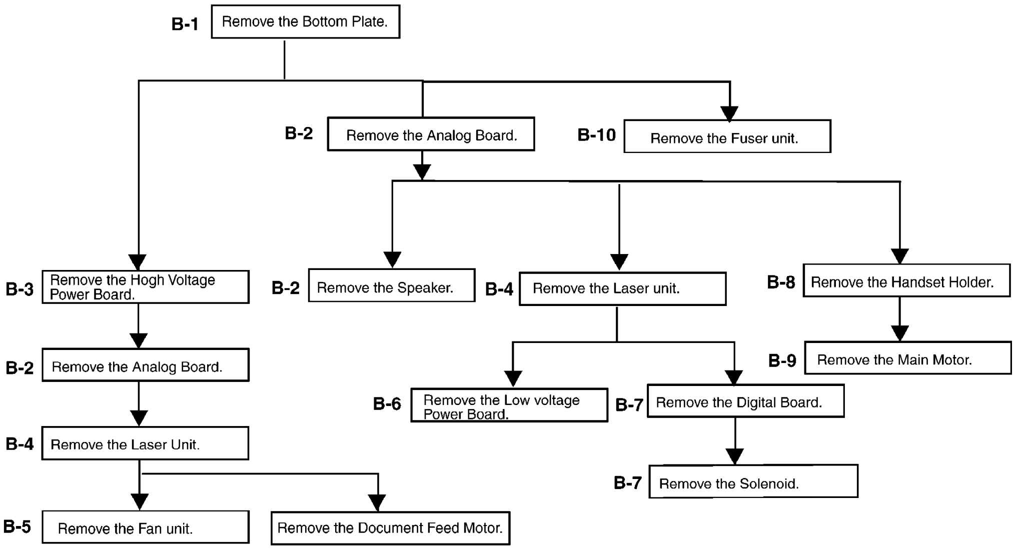
A6: HOW TO REMOVE THE SEPARATION RUBBER ()

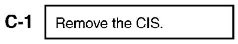
A7: HOW TO REMOVE THE TRANSFER ROLLER ()

A9: HOW TO REMOVE THE FAN UNIT ()

A10: HOW TO REMOVE THE LOW VOLTAGE POWER BOARD ()

5.2. LOWER MAIN CABINET SECTION


B-1
Remove the Bottom Plate.
B-2
Remove the Analog Board.
B-10
Remove the Fuser unit.
B-3
Remove the Hogh Voltage Power Board.
B-2
Remove the Speaker.
B-4
Remove the Laser unit.
B-8
Remove the Handset Holder.
B-2
Remove the Analog Board.
B-9
Remove the Main Motor.
B-6
Remove the Low voltage Power Board.
B-7
Remove the Digital Board.
B-4
Remove the Laser Unit.
B-7
Remove the Solenoid.
B-5
Remove the Fan unit.
Remove the Document Feed Motor.


C-1
Remove the CIS.

CROSS REFERENCE:

A1: HOW TO REMOVE THE OPERATION PANEL ASS'Y ()

A5: HOW TO REMOVE THE LOWER FLAME ()

A6: HOW TO REMOVE THE SEPARATION RUBBER ()

A7: HOW TO REMOVE THE TRANSFER ROLLER ()

B1: HOW TO REMOVE THE BOTTOM PLATE ()

B2: HOW TO REMOVE THE ANALOG BOARD ()

B3: HOW TO REMOVE THE HIGH VOLTAGE POWER BOARD ()

B4: HOW TO REMOVE THE LASER UNIT ()

B5: HOW TO REMOVE THE SOLENOID ()

5.3. HOW TO REMOVE THE OPERATION PANEL ASS'Y

PROCEDURE: A-1

REF.NO.A-1

(1) Open the Front Cover.
(2) Insert the small screwdriver as illustrated in Fig-1
(3) Close the Front Cover with the screwdriver remaining like Fig-2 and raise it with the screwdriver.
(4) Lift up the Front Cover.(Fig-3)
*When disassembling the Front Cover , turn the unit on its side, as shown in Fig-4.

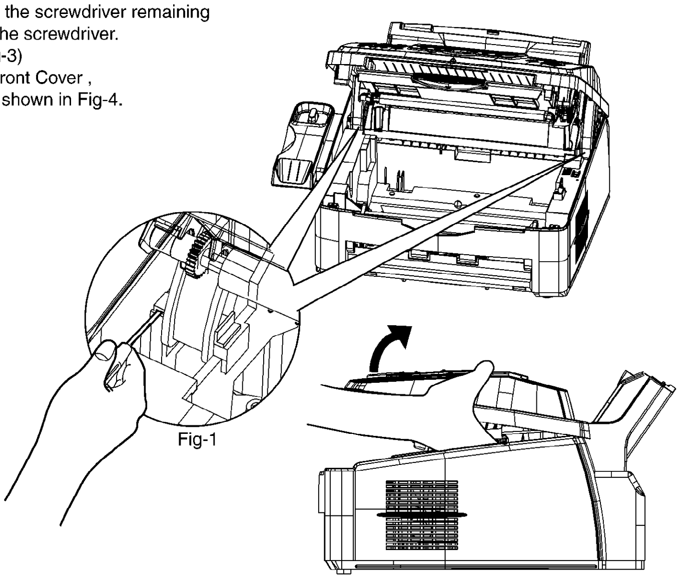


Fig-1

Fig-2

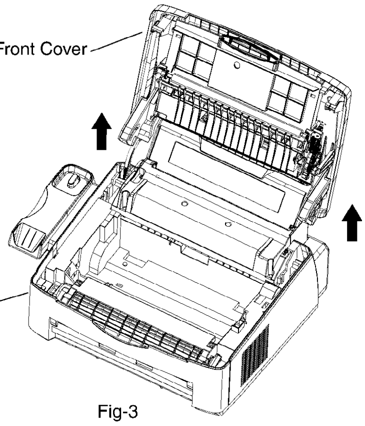


Fig-3

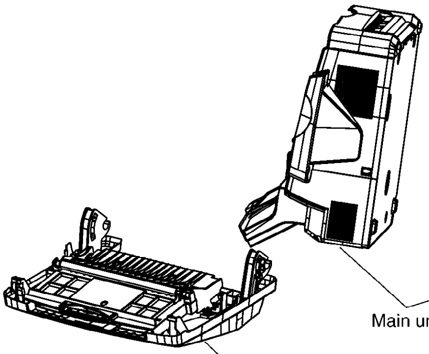


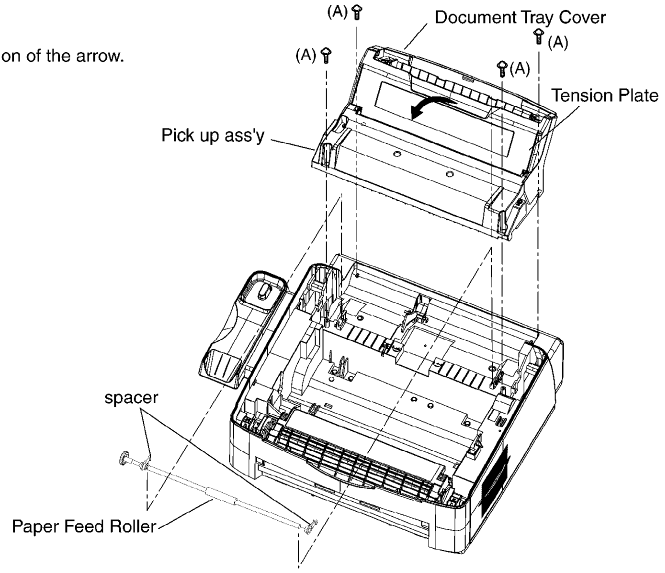
Fig-4

5.4. HOW TO REMOVE THE PICK UP UNIT

PROCEDURE: A1--> A-2

REF.NO.A-2

1) Pull the tension plate in the derection of the arrow.
2) Remove the 4 screws (A).
3) Lift up the Pick up ass'y.
4) Remove the 2 spacers.
5) Remove the Paper Feed Roller.

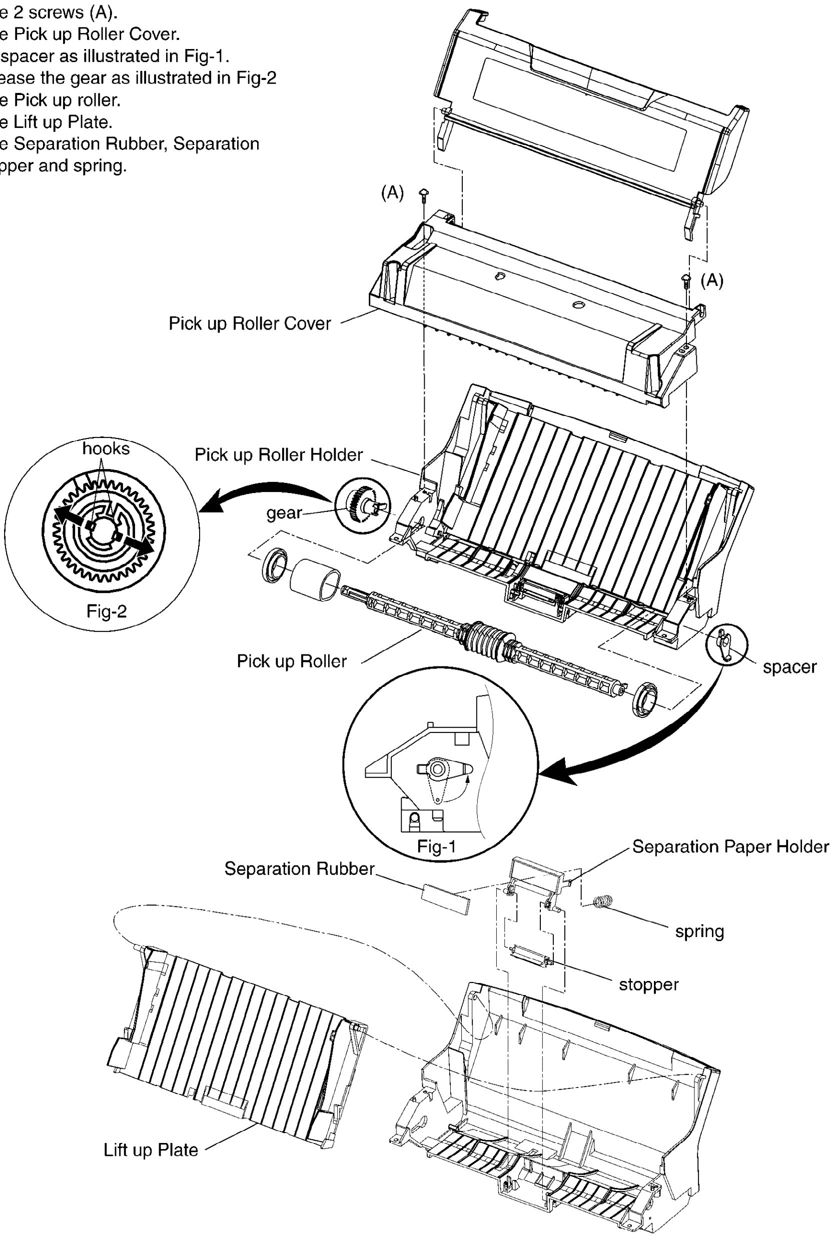

(A)
Document Tray Cover
(A)
(A)
(A)
Tension Plate
Pick up ass'y
spacer
Paper Feed Roller

5.5. HOW TO REMOVE THE PICK UP ROLLER

PROCEDURE: A-1-->A-2-->A-3

REF.NO.A-3

1) Remove the 2 screws (A).
2) Remove the Pick up Roller Cover.
4) Rotate the spacer as illustrated in Fig-1.
   and the release the gear as illustrated in Fig-2
5) Remove the Pick up roller.
6) Remove the Lift up Plate.
7) Remove the Separation Rubber, Separation
   Holder, stopper and spring.

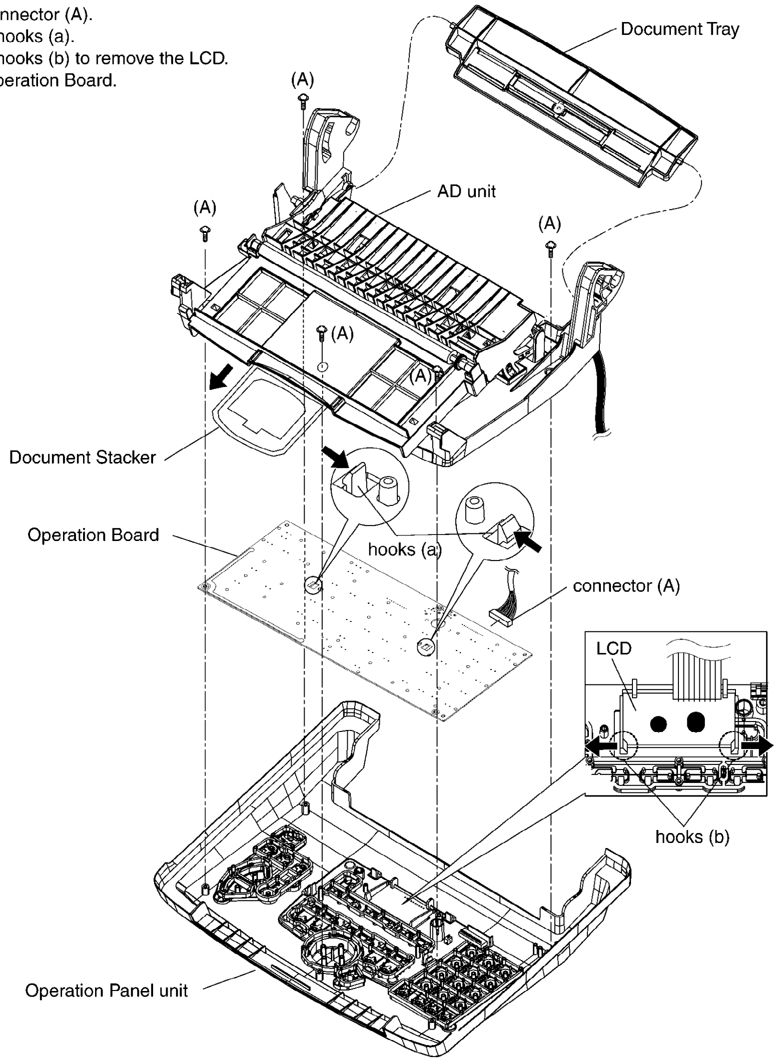

(A)
(A)
Pick up Roller Cover
hooks
Pick up Roller Holder
gear
Fig-2
Pick up Roller
spacer
Fig-1
Separation Paper Holder
Separation Rubber
spring
stopper
Lift up Plate

5.6. HOW TO REMOVE THE OPERATION BOARD

PROCEDURE: A-1--> A-4

REF.NO.A-4

1) Pull out the Document Stacker ahead.
2) Remove the 5 screws (A)
3) Separate the AD (Auto Document Feeder) unit from the Operation Panel unit.
4) Remove the connector (A).
5) Release the 2 hooks (a).
6) Release the 2 hooks (b) to remove the LCD.
7) Remove the Operation Board.

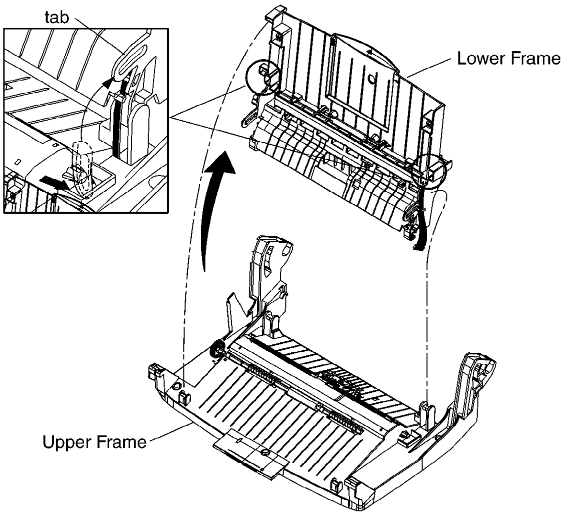

Document Tray
(A)
(A)
AD unit
(A)
(A)
(A)
Document Stacker
Operation Board
hooks (a)
connector (A)
LCD
hooks (b)
Operation Panel unit

5.7. HOW TO REMOVE THE LOWER FLAME

PROCEDURE: A1--> A-4--> A-5

REF.NO.A-5

1) Push the two tabs toward the outside of the unit and lift the Lower Frame.

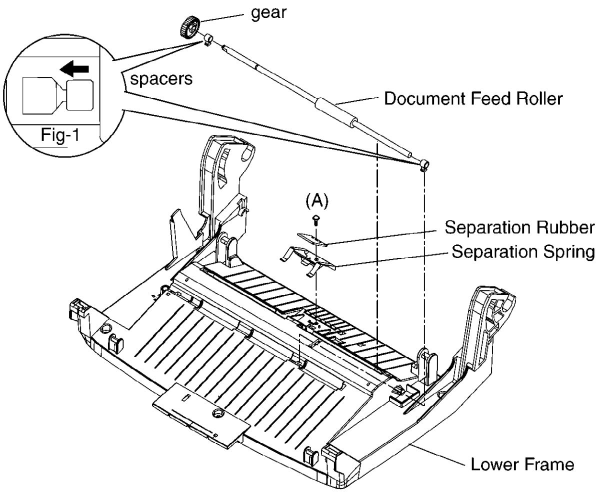

tab
Lower Frame
Upper Frame

5.8. HOW TO REMOVE THE SEPARATION RUBBER

PROCEDURE: A-1--> A-4--> A-5--> A-6

REF.NO.A-6

1) Remove the screw (A).
2) Remove the Separation Rubber and Separation Spring.
3) Remove the 2 spacers as illustrated Fig-1.
4) Remove the gear.
5) Remove the Document Feed Roller.

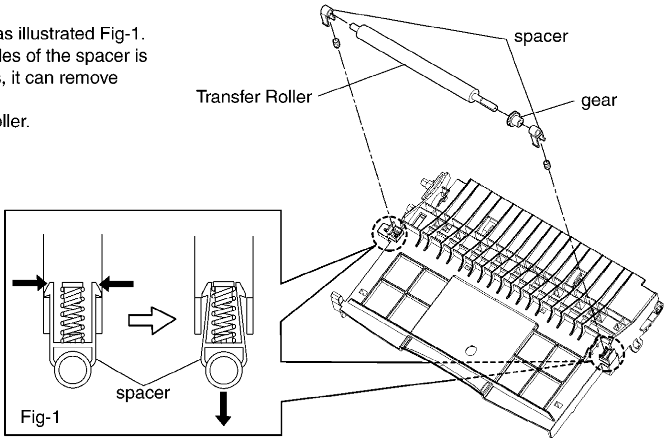

gear
spacers
Fig-1
Document Feed Roller
(A)
Separation Rubber
Separation Spring
Lower Frame

5.9. HOW TO REMOVE THE TRANSFER ROLLER

PROCEDURE: A-1--> A-4--> A-5--> A-7

REF.NO.A-7

1) Remove the 2 spacers as illustrated Fig-1.
   (If the leg of both the sides of the spacer is pinched using tweezers, it can remove easily.)
2) Remove the Transfer Roller.

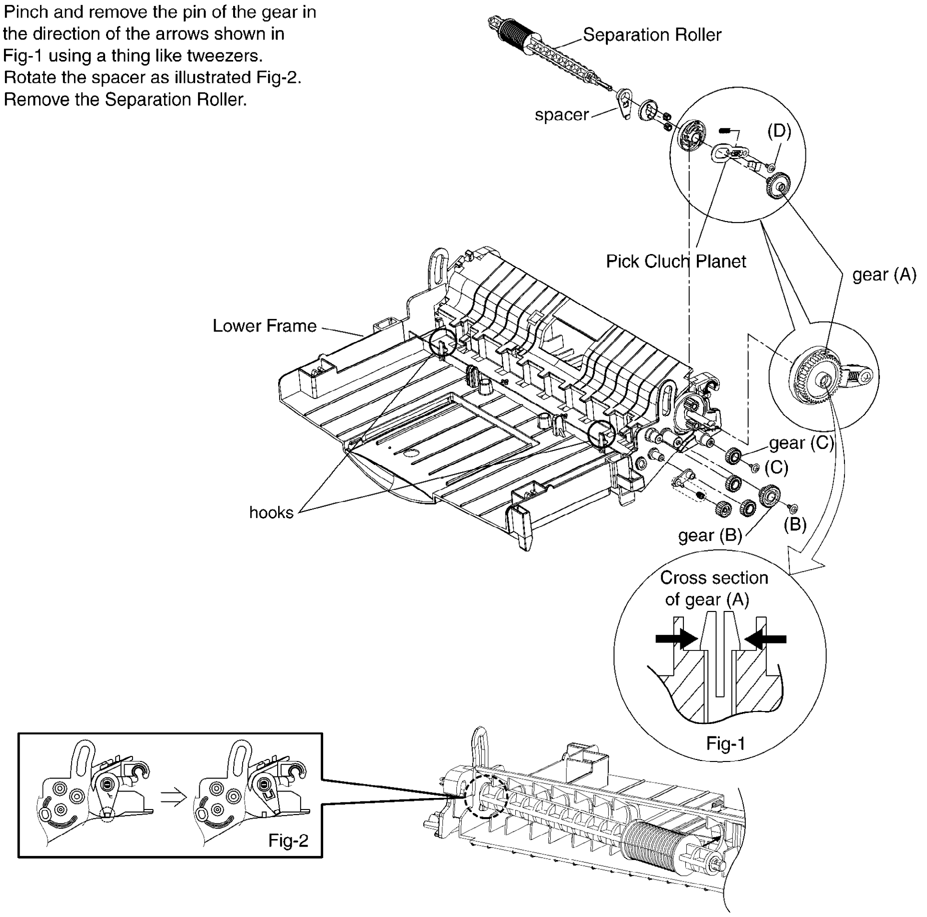

spacer
Transfer Roller
gear
spacer
Fig-1

5.10. HOW TO REMOVE THE SEPARATION ROLLER

PROCEDURE: A-1--> A-4--> A-5--> A-8

REF.NO.A-8

1) Remove the screw (B) and (C).
2) Remove the gear (B) and (C).
3) Pinch and remove the pin of the gear in the direction of the arrows shown in Fig-1 using a thing like tweezers.
4) Rotate the spacer as illustrated Fig-2.
5) Remove the Separation Roller.

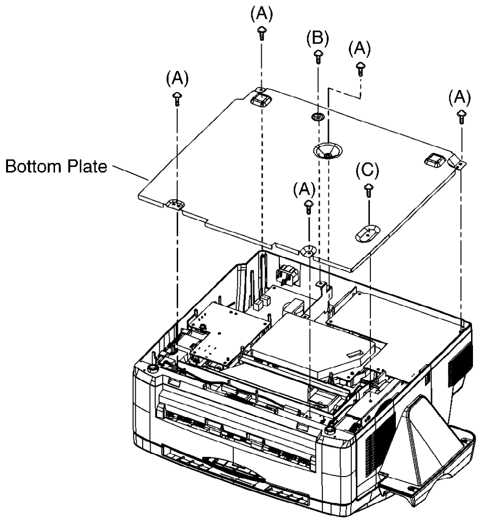

Separation Roller
spacer
(D)
Pick Cluch Planet
gear (A)
Lower Frame
gear (C)
(C)
hooks
gear (B)
(B)
Cross section of gear (A)
Fig-1
Fig-2

5.11. HOW TO REMOVE THE BOTTOM PLATE

PROCEDURE:B-1

REF.NO.B-1

1) Remove the 5 screws (A).
2) Remove the screws (B).
3) Remove the screw (C).
4) Remove the Bottom Plate.



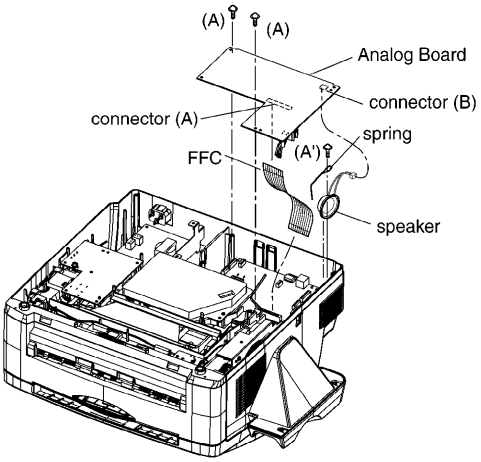
(A)
(B)
(A)
(A)
(A)
Bottom Plate
(A)
(C)

5.12. HOW TO REMOVE THE ANALOG BOARD

PROCEDURE: B-1--> B-2

REF.NO.B-2

1) Remove the 2 screws (A).
2) Remove the connector (A) and (B).
3) Remove the Analog Board.
4) Remove the screw (A').
5) Remove the spring.
6) Remove the speaker.



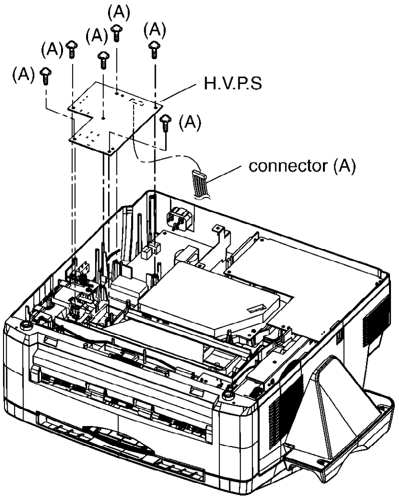
(A)
(A)
Analog Board
connector (B)
connector (A)
spring
FFC
(A')
speaker

5.13. HOW TO REMOVE THE HIGH VOLTAGE POWER BOARD

PROCEDURE: B-1--> B-3

REF.NO.B-3

1) Remove the 6 screws (A).
2) Remove the connector (A).
3) Remove the H.V.P.S. (High Voltage Power Board).

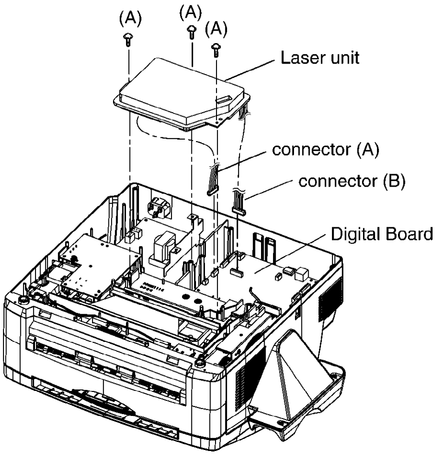

(A)
(A)
(A)
(A)
(A)
(A)
H.V.P.S
connector (A)

5.14. HOW TO REMOVE THE LASER UNIT

PROCEDURE: B-1--> B-2--> B-4

REF.NO.B-4

1) Remove the 3 screws (A).
2) Remove the connector (A) and (B).
3) Remove the Laser unit.

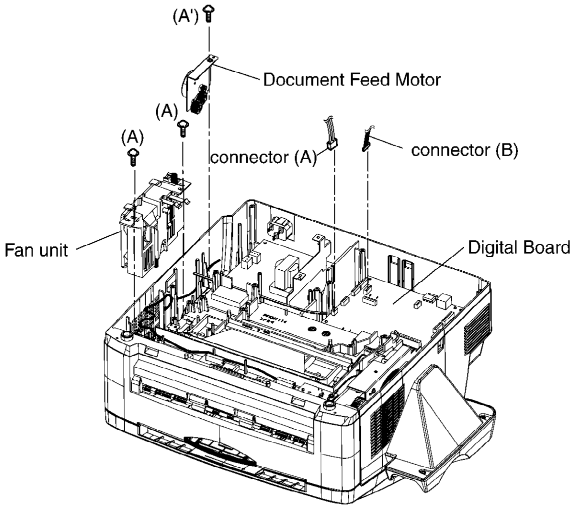

(A)
(A)
(A)
Laser unit
connector (A)
connector (B)
Digital Board

5.15. HOW TO REMOVE THE FAN UNIT

PROCEDURE: B-1--> B-3--> B-2--> B-4--> B-5

REF.NO.B-5

1) Remove the 2 screws (A).
2) Remove the connector (A).
3) Remove the Fan unit.
4) Remove the screw (A').
5) Remove the connector (B).
6) Remove the Document Feed Motor.

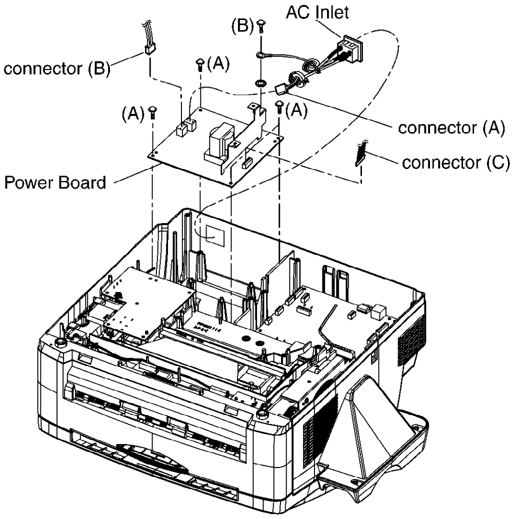

(A')
Document Feed Motor
(A)
(A)
connector (A)
connector (B)
Fan unit
Digital Board

5.16. HOW TO REMOVE THE LOW VOLTAGE POWER BOARD

PROCEDURE: B-1--> B-2--> B-4--> B-6

REF.NO.B-6

1) Remove the screw (B) and connector (A).
2) Remove the AC Inlet.
3) Remove the connector (B) and (C).
4) Remove the 4 screws (A).
5) Remove the Power Board (Low Voltage Power Board).

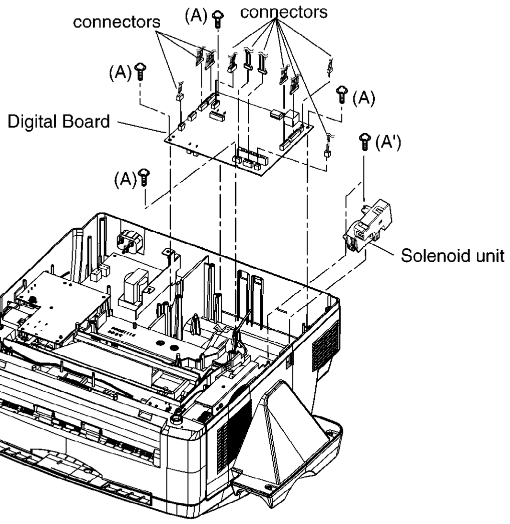

AC Inlet
(B)
connector (B)
(A)
(A)
(A)
connector (A)
connector (C)
Power Board

5.17. HOW TO REMOVE THE SOLENOID

PROCEDURE: B-1--> B-2--> B-4--> B-7

REF.NO.B-7

1) Remove the 4 screws (A).
2) Remove the 10 connectors.
3) Remove the Digital Board.
4) Remove the 2 screws (A').
5) Remove the Solenoid unit.

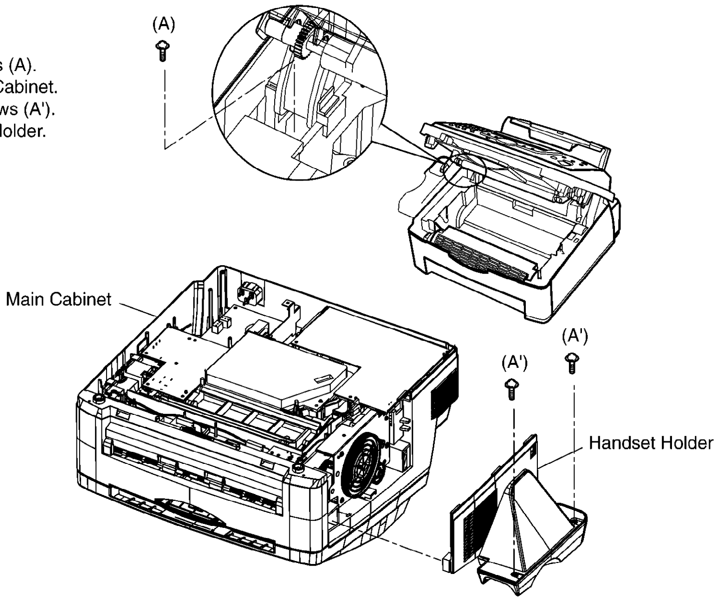

connectors
(A)
connectors
(A)
(A)
Digital Board
(A')
(A)
Solenoid unit

5.18. HOW TO REMOVE THE HANDSET HOLDER

PROCEDURE: A-1--> B-1--> B-8

REF.NO.B-8

1) Remove the screws (A).
2) Reverse the Main Cabinet.
3) Remove the 2 screws (A').
4) Remove Handset Holder.

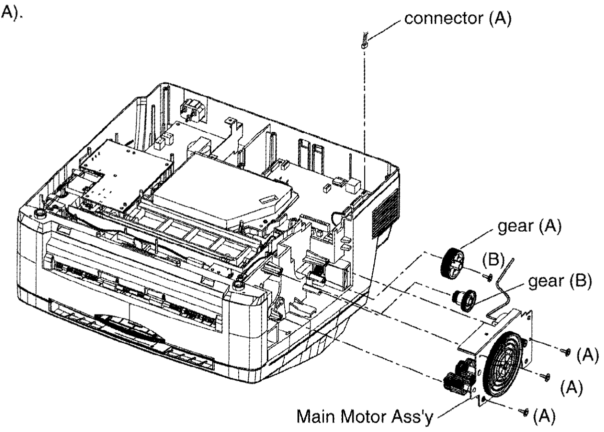

(A)
Main Cabinet
(A')
(A')
Handset Holder

5.19. HOW TO REMOVE THE MAIN MOTOR

PROCEDURE: B-1--> B-2--> B-8--> B-9

REF.NO.B-9

1) Remove the 3 screw (A) and connector (A).
2) Remove the Main Motor Ass'y.
3) Remove the screw (B).
4) Remove the gear (A) and (B).


connector (A)
gear (A)
(B)
gear (B)
(A)
(A)
Main Motor Ass'y
(A)

5.20. HOW TO REMOVE THE FUSER UNIT

PROCEDURE: B-1--> B-10

REF.NO.B-10

First of all,reverse the Main Unit. and remove the bottom Plate.(see the REF.NO.B-1)

1) Remove the connector (A) ,(B) and (C).(Fig-1)
2) Revert the Main Unit.
3) Remove the 2 screws (A).
4) Lift up the Fuser unit from the Main Cabinet.

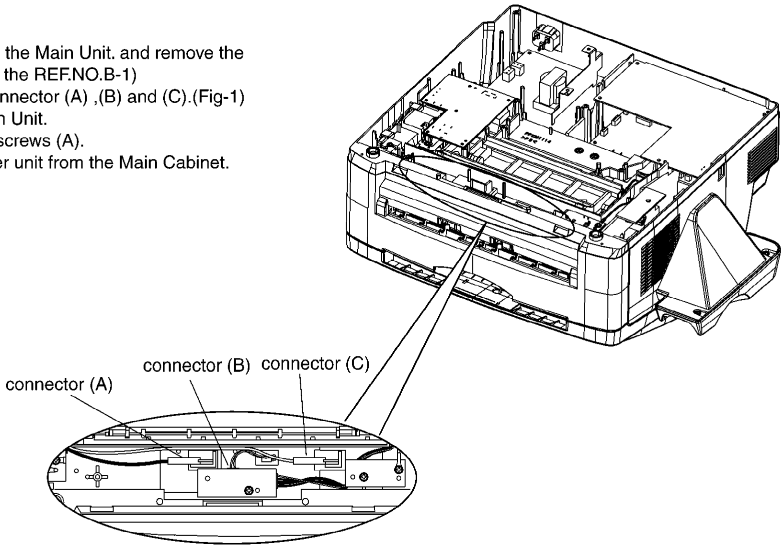
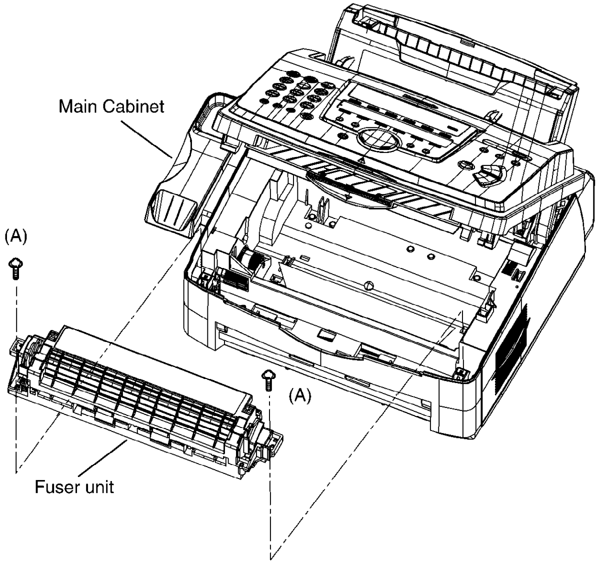

connector (B)
connector (C)
connector (A)

Fig-1


Main Cabinet
(A)
(A)
Fuser unit

5.21. HOW TO REMOVE THE CIS

PROCEDURE: C-1

REF.NO.C-1

1) Lift open the Front Cover.
2) Pull the tab(gray) back to free it from the pin (white) . on both the left and right sides of the unit (Fig-a).
3) Push the CIS in the direction of an arrow to release the hooks.(Fig-b).
4) Remove the CIS.

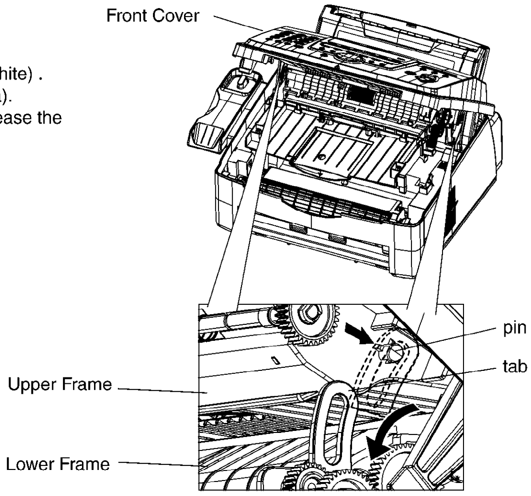

Front Cover
pin
tab
Upper Frame
Lower Frame

Fig-a

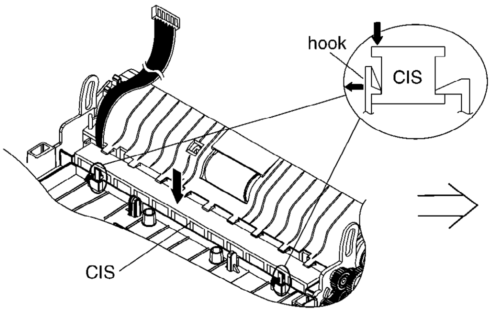

hook
CIS
CIS

Fig-b

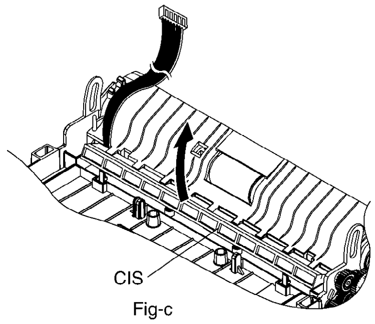
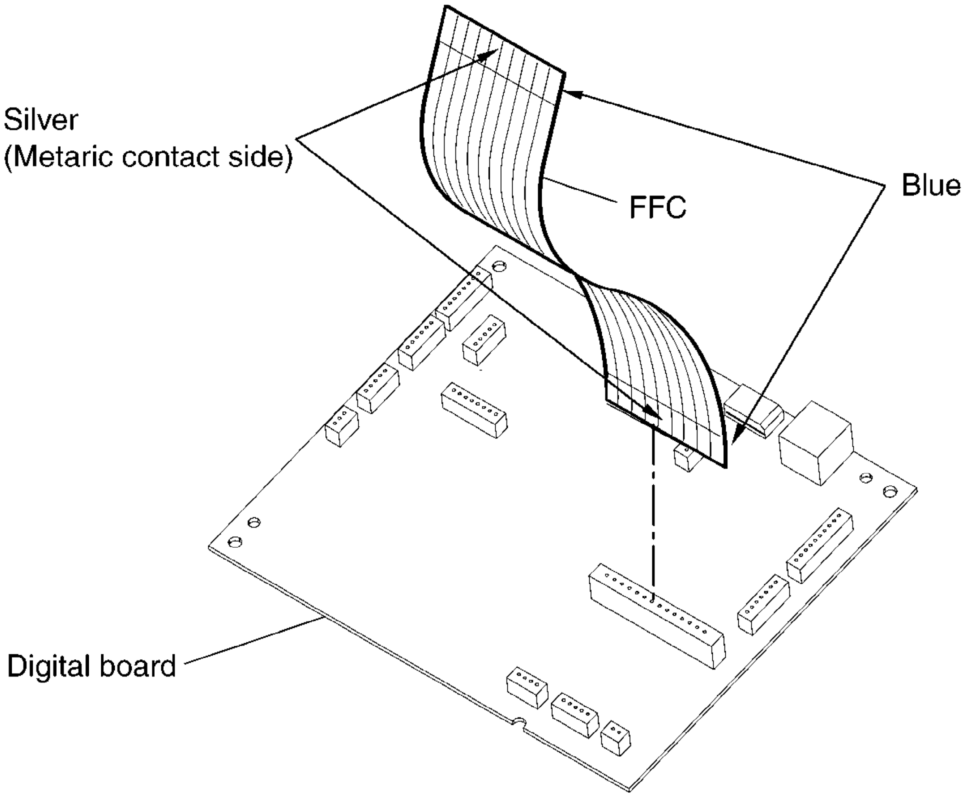


Fig-c

5.22. NOTE FOR ASSEMBLING

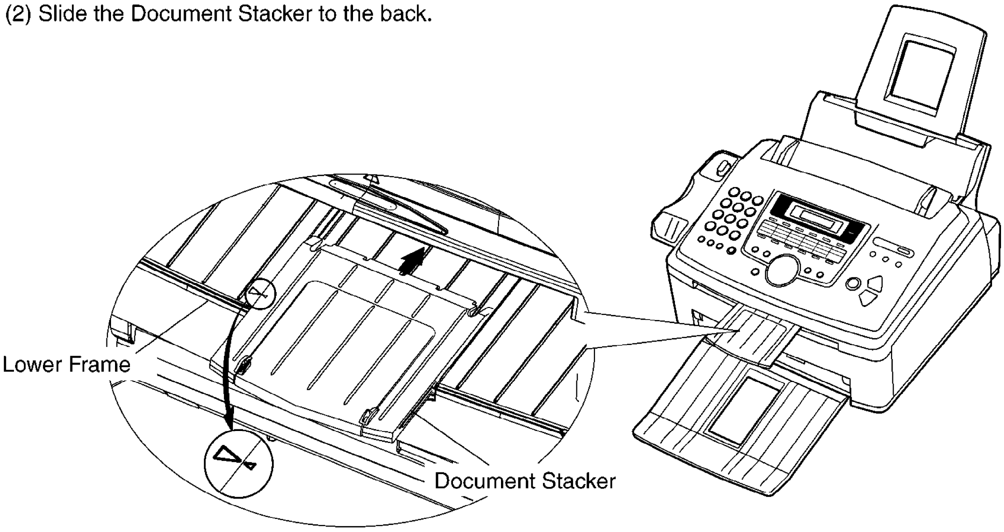
5.22.1. FCC (DIGITAL BOARD)

Install the FFC as following pictures,when you connect the FFC to the digital board.


Silver
(Metaric contact side)
FFC
Blue
Digital board

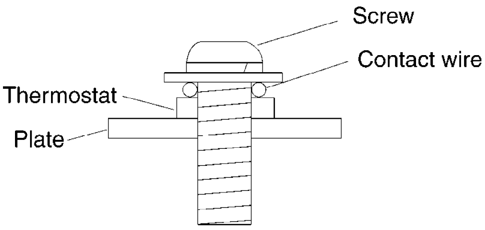
5.22.2. DOCUMENT STACKER

(1) Mark of a Lower Frame and Document Stacker is united and assemble.
(2) Slide the Document Stacker to the back.


Lower Frame
Document Stacker

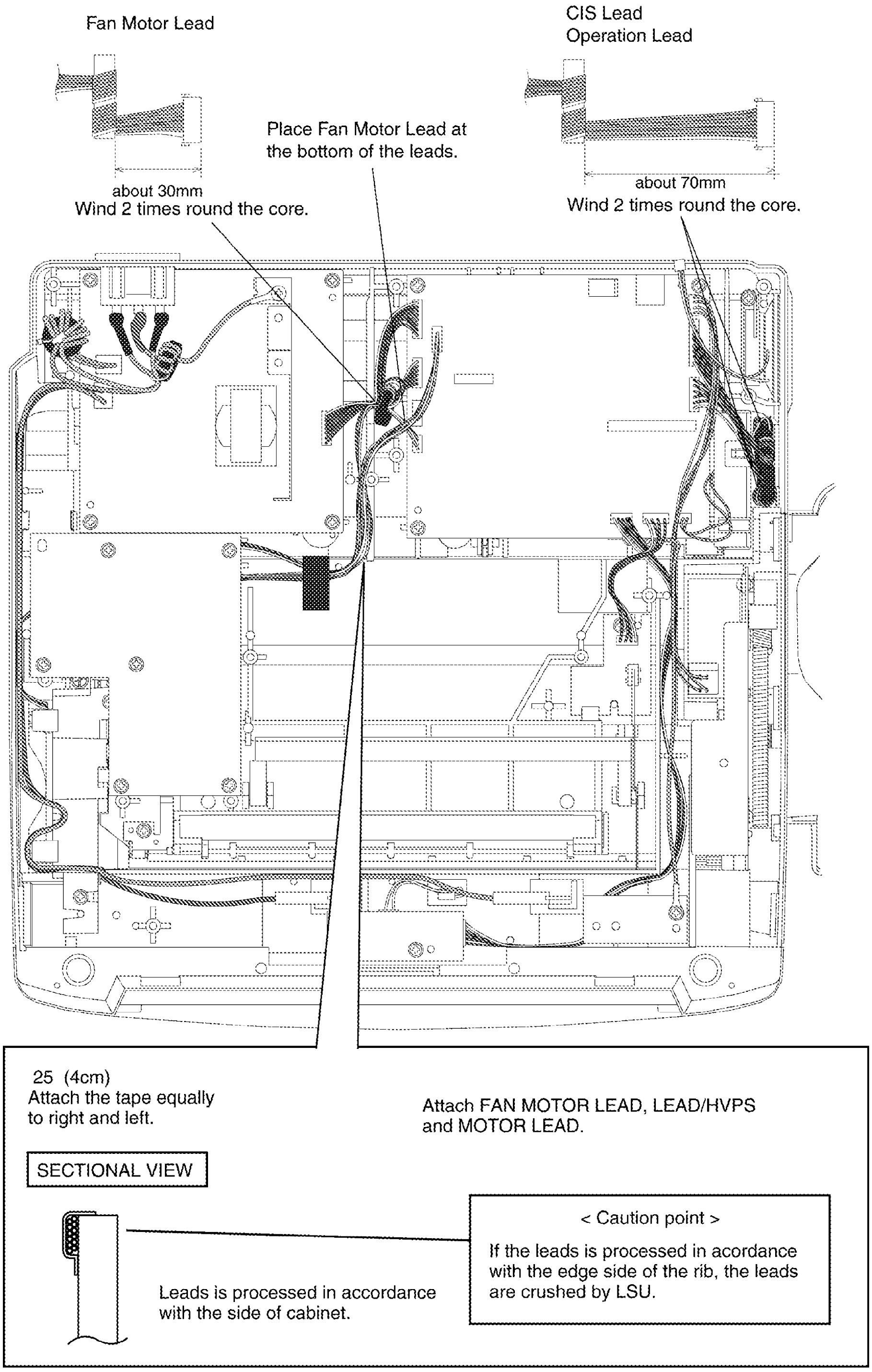
5.22.3. THERMOSTAT

Attach the thermostat correctly, as shown in the right figure.
Do not use the thermostat which changed.


Screw
Contact wire
Thermostat
Plate

(Cross section)

5.23. INSTALLATION POSITION OF THE LEAD


Fan Motor Lead
about 30mm
Wind 2 times round the core.
Place Fan Motor Lead at the bottom of the leads.
CIS Lead
Operation Lead
about 70mm
Wind 2 times round the core.
25 (4cm)
Attach the tape equally to right and left.
Attach FAN MOTOR LEAD, LEAD/HVPS and MOTOR LEAD.
SECTIONAL VIEW
Leads is processed in accordance with the side of cabinet.
< Caution point >
If the leads is processed in acordance with the edge side of the rib, the leads are crushed by LSU.

6. TROUBLESHOOTING GUIDE

6.1. USER RECOVERABLE ERRORS

If the unit detects a problem, one or more of the following messages will appear on the display. The explanations given in the [ ] are for servicemen only.

DISPLAY MESSAGE	CAUSE AND REMEDY
CALL SERVICE 1	-Polygon motor error. Refer to CALL SERVICE 1 ().
CALL SERVICE 2	-Laser beam error. Replace LSU unit. Refer to CALL SERVICE 2 ().
CALL SERVICE 3	-Fuser unit cannot heat up. Replace fuser unit. Refer to CALL SERVICE 3 ().
CALL SERVICE 4	-Fan motor error. Replace fan motor. Refer to CALL SERVICE 4 ().
CHANGE DRUM ↕ CHANGE SUPPLIES	-There is something wrong with the drum unit. Replace the drum unit and the toner cartridge.
CHECK DOCUMENT	-The document is not fed into the unit properly. Reinsert the document. If misfeeding occurs frequentl document feeder rollers and try again.
CHECK DRUM	-The drum unit is not inserted properly. Reinsert it correctly. -The installed drum is worn out. Replace the drum unit with a new one.
CHECK MEMORY	-The memory (telephone numbers, parameters, etc.) has been erased. Re-program.
COVER OPEN	-The front cover is open. Close it.
DIRECTORY FULL	-There is no space to store new entries in navigator directory. Erase unnecessary entries.
DRUM LIFE OVER REPLACE DRUM ↕ CHANGE SUPPLIES	-The drum life is complete. Replace the drum unit immediately.
FAILED PICK UP	-Recording paper was not fed into the unit properly. Reinsert the recording paper.
FAX IN MEMORY	-The unit has a document in memory. See the other displayed message instructions to print out the d
FAX MEMORY FULL	-The memory is full of received documents due to lack of recording paper or a recording paper jam, et paper or clear the jammed paper. -When performing memory transmission, the document being stored exceeds the memory capacity of Transmit the entire document manually.
LOW TEMP.	-The inside of the unit is extremely cold and cannot be operated. Use the unit in a warmer area. While cannot be operated, the received documents are temporarily stored into the memory, and will be print automatically when the unit warms up.
MEMORY FULL	-When making a copy, the document being stored exceeds the memory capacity of the unit. Press [S clear the message. Divide the document into sections.
MODEM ERROR	-There is something wrong with the modem circuit.
NO FAX REPLY	-The other party´s fax machine is busy or has run out of recording paper. Try again.
OUT OF PAPER	-Recording paper is not installed or the unit has run out of paper. Install paper. -Recording paper is not fed into the unit properly. Reinstall paper.
PAPER JAMMED	-A recording paper jam occurred. Clear the jammed paper. [If the printout jams, please refer to RECORDING PAPER JAMS ().]
PLEASE WAIT	-The unit is warming up. Wait for a while.
POLLING ERROR	-The other party's fax machine does not offer the polling function. Check with the other party.

DISPLAY MESSAGE	CAUSE AND REMEDY
REDIAL TIME OUT	-The other party´s fax machine is busy or has run out of recording paper. Try again.
REMOVE DOCUMENT	-The document is jammed. Remove the jammed document. -Attempted to transmit a document longer than 600 mm (23 5/8”). Press the [STOP] to remove the do Divide the document into two or more sheets and try again. -[Alternately, turn off service code #559 to enable sending of documents longer than 600 mm] (Refer t DOCUMENT JAMS ().)
REPLACE DRUM SOON	-The drum life is near to the end. Replace the drum unit as soon as possible.
TONER EMPTY ↕ CHANGE SUPPLIES	-The toner life is complete. Replace the toner cartridge immediately.
TONER LOW ↕ CHANGE SUPPLIES	-The toner life is near to the end. Replace the toner cartridge as soon as possible.
TRANSMIT ERROR	-A transmission error occurred. Try again.
WARM UP	-The inside of the unit is too cold. Let the unit warm up. Wait for a while.
WRONG PAPER	-The fax message was printed on paper which is shorter than letter size paper. Use the appropriate si -To prevent the drum unit becoming dirty, use A4 or letter size paper.

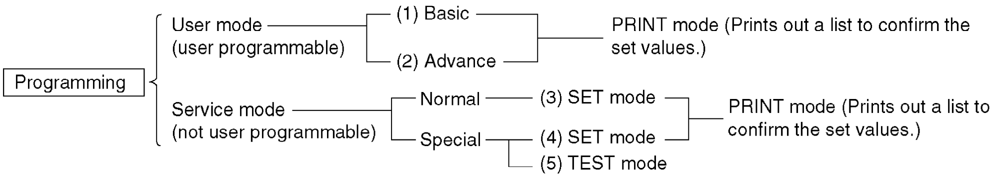
6.2. PROGRAMMING AND LISTS

The programming functions are used to program the various features and functions of the machine, and to test the machine.
This facilitates communication between the user and the service man while programming the unit.

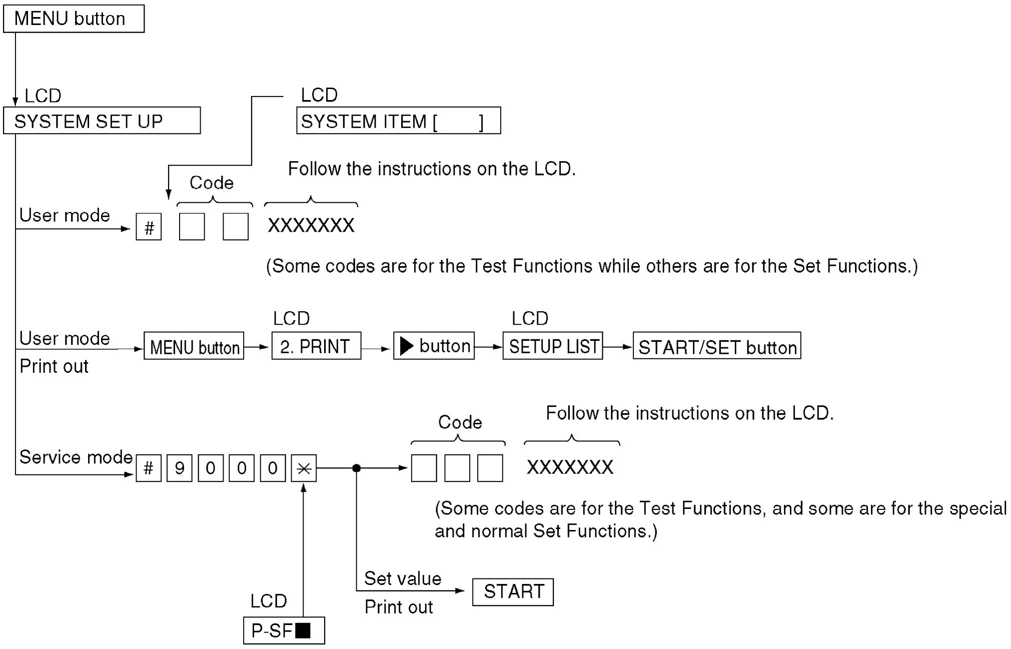
6.2.1. OPERATION

There are 2 basic categories of programming functions, the User Mode and the Service Mode. The Service Mode is further broken down into the normal and special programs. The normal programs are those listed in the Operating Instructions and are available to the user. The special programs are only those listed here and not displayed to the user. In both the User and Service Modes, there are Set Functions and Test Functions. The Set Functions are used to program various features and functions, and the Test Functions are used to test the various functions. The Set Functions are accessed by entering their code, changing the appropriate value, then pressing the SET key. The Test Functions are accessed by entering their code and pressing the key listed on the menu. While programming, to cancel any entry, press the STOP key.

6.2.2. OPERATION FLOW


Programming
User mode
(user programmable)
(1) Basic
(2) Advance
PRINT mode (Prints out a list to confirm the set values.)
Service mode
(not user programmable)
Normal
Special
(3) SET mode
(4) SET mode
(5) TEST mode
PRINT mode (Prints out a list to confirm the set values.)

Operating Procedure


MENU button
LCD
SYSTEM SET UP
LCD
SYSTEM ITEM [ ]
Code
Follow the instructions on the LCD.
User mode
#
XXXXXXX
(Some codes are for the Test Functions while others are for the Set Functions.)
User mode
Print out
MENU button
LCD
2. PRINT
▶ button
LCD
SETUP LIST
START/SET button
Code
Follow the instructions on the LCD.
Service mode
# 9 0 0 0 ✳
XXXXXXX
(Some codes are for the Test Functions, and some are for the special and normal Set Functions.)
Set value
Print out
START
LCD
P-SF■

6.2.3. SERVICE FUNCTION TABLE

Code	Function	Set Value	Effective Range	Default	Remarks
501	Pause time set	X 100 msec	001~600	030	----------
502	Flash time	X 10 ms	01~99	70	----------
514	Bell signal detect time	X 100msec	1~9	3	----------
520	CED frequency select	1:2100 Hz 2:1100 Hz	1, 2	1	See Symptom/Countermeasu for long distance and internat calls in ().
521	International mode select	1:ON 2: OFF	1, 2	1	See Symptom/Countermeasu for long distance and internat calls in ().
522	Auto standby select	1:ON 2: OFF	1, 2	1	The resolution reverts to the when transmission is comple
523	Receive equalizer select	1: 0 km / 2: 1.8 km / 3: 3.6 km / 4: 7.2 km	1~4	1	Set RX equalizer to automatic

Code	Function	Set Value	Effective Range	Default	Remarks
524	**Transmission equalizer select**	**1: 0 km / 2: 1.8 km / 3: 3.6 km / 4: 7.2 km**	**1~4**	**1**	
529	**Call Service Clear**				
544	**Document feed position adjustment value set**	**X mm**	**0~4**	**2**	**When the ADF function is in c adjust the feed position.**
550	**Memory clear.**				**See ().**
551	**ROM check**				**See ().**
552	**DTMF single tone test**	**1:ON 2: OFF**	**1, 2**	**2**	**See ().**
553	**Monitor on FAX communication select**	**1:OFF 2: PHASE B 3 :ALL**	**1~3**	**1**	**Sets whether to monitor the li signal with the unit's speaker FAX communication or not.**
554	**Modem test**				**See ().**
555	**Scan check**				**See ().**
556	**Motor test**			**0**	**See ().**
557	**LED test**				**See ().**
558	**LCD test**				**See ().**
561	**KEY test**				**See ().**
571	**ITS auto redial time set**	**X number of times**	**00~99**	**05**	**Selects the number of times t is redialed (not including the f dial).**
572	**ITS auto redial line disconnection time set**	**X second**	**001~999**	**065**	**Sets the interval of ITS rediali**
573	**Remote turn-on ring number set**	**X number of rings**	**01~99**	**10**	**Sets the number of rings befo unit starts to receive a docum the TEL mode.**
590	**FAX auto redial time set**	**X number of times**	**00~99**	**05**	**Selects the number of redial t during FAX communication (n including the first dial).**
591	**FAX auto redial time disconnection time set**	**X second**	**001~999**	**065**	**Sets the FAX redial interval du FAX communication.**
592	**CNG transmit select**	**1:OFF / 2: ALL / 3: AUTO**	**1~3**	**2**	**Lets you select the CNG outpu during FAX transmission. ALL is output at phase A. AUTO: C output only when automatic d is performed. OFF: CNG id no at phase A. Refer to ().**
593	**Time between CED and 300bps**	**1:75 msec / 2:500 msec / 3:1 sec**	**1~3**	**1**	**See Symptom/Countermeasu for long distance and internat calls in (). Refer to () and ().**

Code	Function	Set Value	Effective Range	Default	Remarks
594	Overseas DIS detection select	1:detects at the 1st time / 2: detects at the 2st time	1, 2	1	See Symptom/Countermeasu for long distance and internat calls in (). Refer to () and ().
595	Receive error limit value set	1: 5% / 2: 10% / 3: 15% / 4: 20%	1~4	2	If the number of errors during transmission exceeds this val sending side terminates the c
596	Transmit level set	X dBm	- 15~00	11	Selects the FAX transmission Refer to ()and ().
598	Receiving sensitivity	43= -43 dBm	20~48	41	Used when there is an error p Refer to ().
599	ECM frame size	1:256 2:64	1, 2	1	----------
628	H.V.P.S. check				See ().
630	Paper Jam Cause Distinction Code				0:No Paper Jam 1:The paper was pulled into t 2:The paper was longer than maximum length of the regist sensor. 3:The paper exit was not dete after the registration. 4:The paper was longer than maximum length of the paper sensor. 5:The register sensor or pape sensor was turned ON before motor started to rotate. 6:The register sensor chatter 7:The paper exit sensor chatt
639	LSU test				See ().
651	Write system program into the Flash Rom with a tool.				See the parts number of the t The tool includes the operati manual for writing program.
655	Cause Distinction Code of Call Service 3				See ().

Code	Function	Set Value	Effective Range	Default	Remarks
717	Transmit speed selection	1: 14400BPS 2: 12000BPS 3:9600BPS / 4: 7200BPS / 5:4800BPS / 6: 2400BPS	1~6	1	Adjusts the speed to start trai during FAX transmission. Ref and
718	Receive speed selection	1: 14400BPS 2: 12000BPS 3:9600BPS / 4: 7200BPS / 5:4800BPS / 6: 2400BPS	1~6	1	Adjusts the speed to start trai during FAX reception. Refer t
721	Pause tone detect	1:ON 2: OFF	1, 2	2	Selects the tone detection for in dialing.
722	Redial tone detect	1:ON 2: OFF	1, 2	1	Sets the tone detection mode redialing.
763	CNG detect time for friendly reception	1:10 sec / 2 :20 sec / 3: 30 sec	1~3	3	Selects the CNG detection tor friendly reception.
771	T1 timer	1:35 sec / 2 :60 sec	1, 2	1	Sets a higher value when the response from the other party more time during FAX transm
774	T4 timer	X 100 sec	00~99	00	Use this function when delay in the line and communicatio Mobile comm) does not work
815	Sensor & Vox check				See ().
852	Print test pattern				See ().
853	Top margin		1~5	3	----------
854	Left margin		1~7	4	----------
874	DTMF ON time	X msec	060~200	90	----------
875	DTMF OFF time	X msec	060~200	90	----------
880	History list				See ().
881	Journal 2 list				See ().
882	Journal 3 list				See ().

6.3. TEST FUNCTIONS

The codes listed below can be used to perform simple checks of some of the unit’s functions. When complaints are received from customers, they provide an effective tool for identifying the locations and causes of malfunctions.

Test Mode	Type of Mode	Code Operation after code input	Function
MOTOR TEST	Service Mode	“5” “5” “6” START	0: Recording paper feed 1: Auto Document feed (STANDARD) 2: Auto Document feed (FINE) 3: Auto Document feed (SUPER FINE)
MODEM TEST	Service Mode	“5” “5” “4” START	Telephone line circuit is connected automatically, the following signals on the circuit line. 1) OFF 2) 14400bps 3) 12000bps 4) 9600bps 5) 7200 bps 6) 4800bps 7) 2400bps 8) 300bps 9) 2100Hz 10) 1100Hz
ROM CHECK	Service Mode	“5” “5” “1” START	Indicates the version and checks the sum of the F
LCD CHECK	Service Mode	“5” “5” “8” START	Checks the LCD indication. Illuminates all the dots to check if they are norma Refer to OPERATION PANEL SECTION ().
DTMF SINGLE TEST	Service Mode	“5” “5” “2” 1....ON 2....OFF	Outputs the DTMF as single tones. Used to check frequencies of the individual DTMF tones. Refer t SINGLE TONE TRANSMIT SELECTION ().
LED CHECK	Service Mode	“5” “5” “7” START	All LEDs above the operation panel board flash o or are illuminated.
KEY CHECK	Service Mode	“5” “6” “1” START (any key)	Checks the button operation. Indicates the button code on the LCD while the bu pressed. Refer to BUTTON CODE TABLE (), OPER PANEL SECTION ().
CIS TEST	Service Mode	“5” “5” “5”	LED lights up, CIS scanning. Refer to CIS (Contac Sensor) SECTION ().
LSU TEST	Service Mode	“6” “3” “9”	Laser radiates, Polygon rotates Refer to LSU SEC
MEMORY CLEAR	Service Mode	“5” “5” “0” START	To reset the value to the default one, except the t (#853), left margin (#854), time / day (#001), logo (no. (#003), History and Directory data. Please restart a power supply after clearing a me
High Voltage Power Supply Board CHECK	Service Mode	“6” “2” “8” START	Refer to HIGH VOLTAGE VALUE CHECK POINT ()
FAN TEST	Service Mode	“6” “7” “7” START	1:TEST OFF 2:High-speed rotation 3:Low-speed rotation

Test Mode	Type of Mode	Code	Function
		Operation after code input	
SENSOR CHECK	Service Mode	“8” “1” “5”	First of all, press the copy button, and confirm th ON/OFF. For each sensor’s operation, refer to SENSORS A SWITCHES SECTION (). [D S C P R E D T * 3F * D 4 * V] : LCD DISPLAY D: Document sensor D: Document set -: No document S: Paper Feed Sensor S: Read position -: No read position C: Printer Cover Switch C: Open -: Close P: Paper sensor P: Recording paper set -: No recording paper R: Regist Sensor R: Detect recording paper -: Not defect recording paper E: Exit Sensor E: Detect recording paper -: Not detect recording paper D: Drum Sensor D: DRUM set -: No DRUM

				T: Toner Sensor **T: Toner sensor ON** **-: Toner sensor OFF** ***: None** **3F: Temperature of THERMISTOR** **Hex (00-FF)** ***: None** **D4: Temperature of Atmosphere** **Hex (00-FF)** ***: None** **V: VOX signal** **V: Detect the tone on the line** **-: Not detect**

Test Mode	Type of Mode	Code Operation after code input	Function
PRINT TEST PATTERN	**Service Mode**	**“8” “5” “2”** **START**	**1. Press “852” then the SET key in the service mo** **2. As “PATNO =” is displayed on the LCD, enter tl pattern No. and press the SET key.** **3. When “No. = “is displayed on the LCD, enter th number and press the SET key. (Press “00” for th printing.)** **4. “MODE” is displayed on the LCD. Press “0” to printing or press “1” to go to the next screen.** **5. When “1” is pressed at MODE, “INTVL = “is dis the LCD. Enter the printing interval (00~99 sec).** **6. The printing repeats the designated number of the programmed printing intervals.**

Note:

The numbers in the boxes (XXX) indicate the keys to be input for the various test modes.

6.3.1. DTMF SINGLE TONE TRANSMIT SELECTION

When set to ON (=1), the 12 keys and transmission frequencies are as shown.

key	Low Frequency (Hz)	Key	High Frequency (Hz)
"1"	697	"5"	1209
"2"	770	"6"	1336
"3"	852	"7"	1477
"4"	941	"8"	1633

When set to OFF (=2), the 12 keys and transmission frequencies are as shown.

High (Hz) Low (Hz)	1209	1336	1477
697	"1"	"2"	"3"
770	"4"	"5"	"6"
852	"7"	"8"	"9"
941	"*"	"0"	"#"

Note:

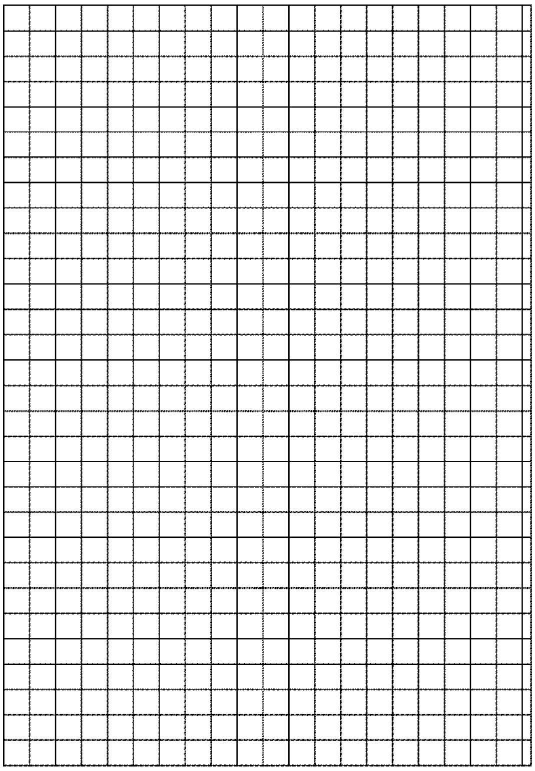
After performing this check, do not forget to turn the setting off. otherwise, dialing in DTMF signal will not work.

6.3.2. BUTTON CODE TABLE

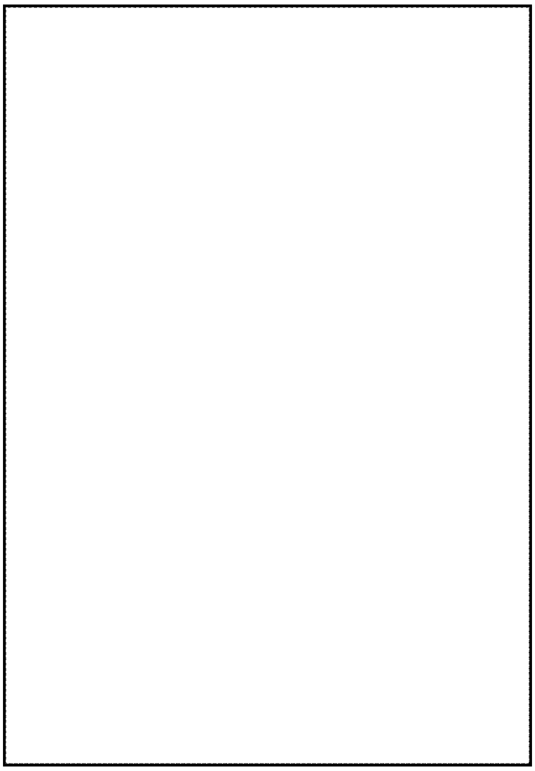
Code	Button Name	Code	Button Name	Code	Button Name
00	NO INPUT	31	1	49	QUICK SCAN
-	STOP	32	2	4C	CALLER ID PRINT
02	RESOLUTION	33	3	4D	COLLATE
04	FAX START	34	4	5B	BROADCAST 1
05	LOWER	35	5	5C	BROADCAST 2
06	COPY START	36	6	5D	MANUAL BROAD
08	MONITOR	37	7	5E	STATION 4
0A	HANDSET MUTE	38	8	5F	STATION 5
0C	AUTO ANSWER	39	9	60	STATION 6
1E	NAVIGATOR NEXT	3A	0	61	STATION 7
1F	NAVIGATOR PREV	3B	*	62	STATION 8
20	MENU	3C	#	63	STATION 9
22	HELP	3D	REDIAL/PAUSE	64	STATION 10
24	DIRECTORY PROGRAM	3E	FLASH	65	STATION 11
25	VOLUME +	47	CALLER ID SEARCH		
26	VOLUME —	48	JUNK FAX PROHIBITOR		

6.3.3. PRINT TEST PATTERN

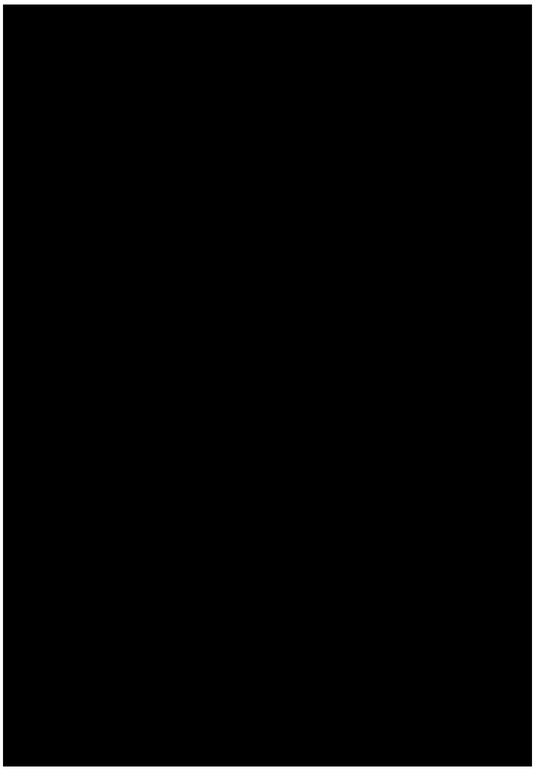
1. NO. 01



2. NO.08



3. NO.20



4. NO.19

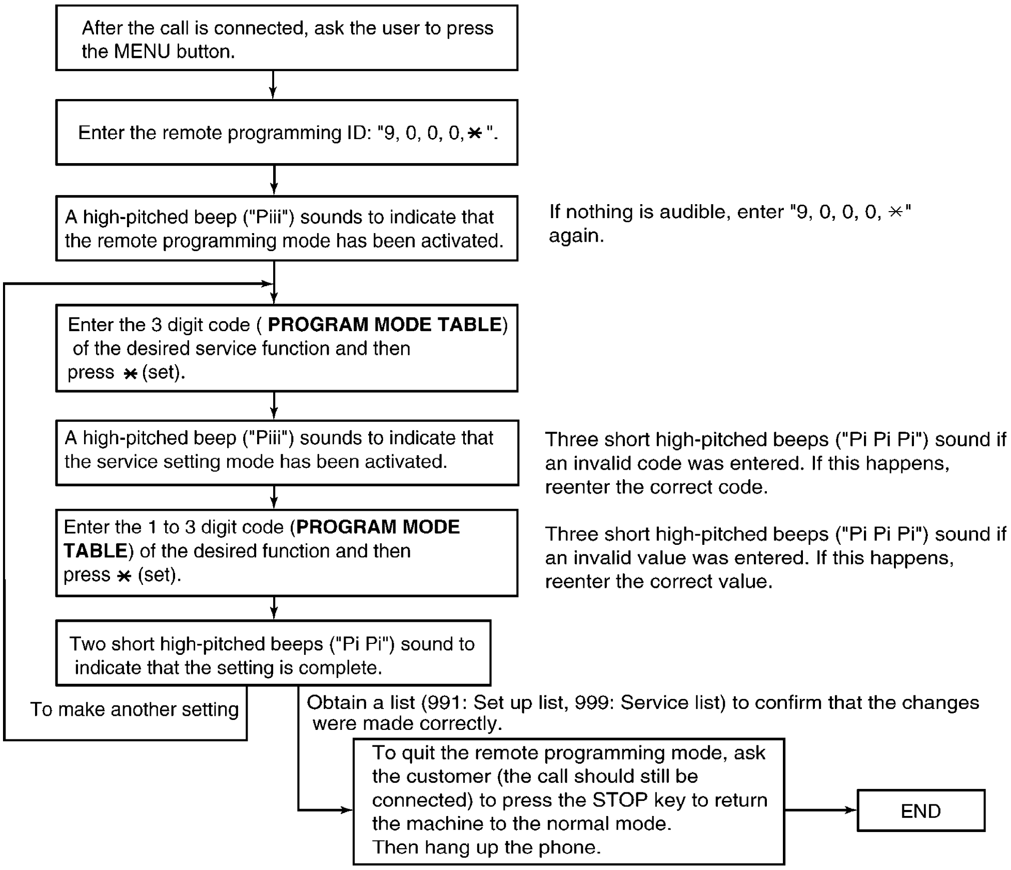
6.4. REMOTE PROGRAMMING

If, after the call is connected, the customer describes the situation and it is determined that the problem can be corrected by making parameter changes, this function makes it possible to change parameters such as the user code and service code from another fax (using DTMF tones). Therefore, travel to the customer's location is not required. However, it is not possible to change all the parameters remotely (PROGRAM MODE TABLE()). The function used to accomplish this is remote programming.
First, in order to check the current status of the service code parameter, print out the setup list (code: 991) and the service list (code: 999) from the customer's fax machine.
Based on this, the parameters for the desired codes can be changed.
The procedure for changing and listing parameters is described on ENTERING THE REMOTE PROGRAMMING MODE AND CHANGING SERVICE CODES(). Also, before exiting the remote programming mode, it is advisable to obtain a new list to confirm that the changes were made correctly.

Hint:
Since the connected telephone is in use during the remote programming mode, it may be helpful to ask the customer to switch to the speakerphone. This frees the customer from the need to remain right next to the fax while you are making parameter settings. When finished, inform the customer. Also note that in very noisy locations where the DTMF tones are not audible, the remote programming function will not work.

6.4.1. ENTERING THE REMOTE PROGRAMMING MODE AND CHANGING

SERVICE CODES


After the call is connected, ask the user to press the MENU button.
Enter the remote programming ID: "9, 0, 0, 0, ✱".
A high-pitched beep ("Piii") sounds to indicate that the remote programming mode has been activated.
If nothing is audible, enter "9, 0, 0, 0, ✱" again.
Enter the 3 digit code (PROGRAM MODE TABLE) of the desired service function and then press ✱ (set).
A high-pitched beep ("Piii") sounds to indicate that the service setting mode has been activated.
Three short high-pitched beeps ("Pi Pi Pi") sound if an invalid code was entered. If this happens, reenter the correct code.
Enter the 1 to 3 digit code (PROGRAM MODE TABLE) of the desired function and then press ✱ (set).
Three short high-pitched beeps ("Pi Pi Pi") sound if an invalid value was entered. If this happens, reenter the correct value.
Two short high-pitched beeps ("Pi Pi") sound to indicate that the setting is complete.
To make another setting
Obtain a list (991: Set up list, 999: Service list) to confirm that the changes were made correctly.
To quit the remote programming mode, ask the customer (the call should still be connected) to press the STOP key to return the machine to the normal mode. Then hang up the phone.
END

CROSS REFERENCE:

PROGRAM MODE TABLE ()

6.4.2. PROGRAM MODE TABLE

Code	Function	Set Value	Default	Remote Setting
001	Set date and time	mm/dd/yy hh:mm	Jan/01/2003	NG
002	Your logo	---------	None	NG
003	Your fax telephone number	---------	None	NG
004	Transmission report mode	2:ON / 3:OFF / 1:ERROR	ERROR	OK
006	FAX ring count	1 to 9 rings	2	OK
012	Remote TAM activation	ON/ID=11 / OFF	OFF	NG
013	Dialing mode	1:PULSE / 2:TONE	TONE	OK
016	Paper size	LETTER / A4 / LEGAL	A4	NG
017	Ringer pattern	A / B / C	A	NG
022	Auto journal print	1:ON / 2:OFF	ON	OK
023	Overseas mode	1:NEXT FAX / 2:ERROR / 3: OFF	ERROR	OK
025	Delayed transmission	ON / OFF	OFF	NG
026	Auto CALLER ID list	1:ON / 2:OFF	ON	OK
031	Distinctive ring	1:ON / 2:OFF	OFF	OK
032	Fax ring pattern	1:B-D / 2:A / 3:B / 4:C / 5:D	B-D	OK
037	Auto REDUCTION	1:ON / 2:OFF	ON	OK
039	LCD contrast	NORMAL / DARKER	NORMAL	NG
041	Remote FAX activation code	ON / OFF	ON CODE=* #9	NG
044	Receive alert	1:ON / 2:OFF	ON	OK
046	Friendly receive	1:ON / 2:OFF	ON	OK
058	Original setting	1:NORMAL 2:LIGHT 3: DARKER	NORMAL	OK
068	ECM Selection	1:ON / 2:OFF	ON	OK
076	FAX tone	1:ON / 2:OFF	ON	OK
079	Toner save	1:ON / 2:OFF	OFF	OK
080	Set default	YES / NO	NO	NG
501	Pause time set	001~600 x 100msec	030	OK
502	Flash time	01~99 x 10ms	70	OK
514	Bell signal detect time	1~9 x 100msec	3	OK
520	CED frequency select	1:2100Hz / 2:1100Hz	2100Hz	OK
521	International mode select	1:ON / 2:OFF	ON	OK
522	Auto standby select	1:ON / 2:OFF	ON	OK
523	Receive equalizer select	1:0kms / 2:1.8km / 3:3.6km / 4 :7.2km	0 km	OK
524	Transmission equalizer select	1:0kms / 2:1.8km / 3:3.6km / 4 :7.2km	0 km	OK
529	Memory clear for Call Service	---------	---------	NG
544	Document feed position adjustment value set	0~4 xmm	2mm	OK
550	Memory clear	---------	---------	NG
551	ROM check	---------	---------	NG
552	DTMF signal tone test	1:ON / 2:OFF	OFF	OK
553	Monitor on FAX communication	1:OFF / 2:Phase B / 3:ALL	OFF	OK

Code	Function	Set Value	Default	Remote Setting
554	Modem test	---------	---------	NG
556	Motor test	---------	---------	NG
557	LED test	---------	---------	NG
558	LCD test	---------	---------	NG
561	Key test	---------	---------	NG
571	ITS auto redial time set	00~99	05	OK
572	ITS auto redial line disconnection time set	001~999sec	065	OK
573	Remote turn-on ring number	01~99	10	OK
590	FAX auto redial time set	00~99	05	OK
591	FAX auto redial line disconnection time set	001~999sec	065	OK
592	CNG transmit select	1:OFF / 2:ALL / 3:AUTO	ALL	OK
593	Time between CED and 300bps	1:75ms / 2:500ms / 3:1sec	75ms	OK
594	Overseas DIS detection select	1:1st / 2:2nd	1st	OK
595	Receive error limit value set	1:5% / 2:10% / 3:15% / 4:20%	10%	OK
596	Transmit level set	-15~00dBm	11	OK
598	Receiving Sensitivity	20~48	41	OK
599	ECM Frame size	1:256 / 2:64	256byte	OK
628	H.V.P.S check	---------	---------	NG
630	Paper jam cause distinction	---------	---------	NG
639	LSU test	---------	---------	NG
651	White system program into the Flash ROM	---------	---------	NG
655	Cause distinction code of call service 3	---------	---------	NG
717	Transmit speed select	1:14400/ 2:12000/ 3:9600/ 4: 7200/ 5:4800/ 6:2400	14400bps	OK
718	Receive speed select	1:14400/ 2:12000/ 3:9600/ 4: 7200/ 5:4800/ 6:2400	14400bps	OK
721	Pause tone detect	1:ON / 2:OFF	OFF	OK
722	Redial tone detect	1:ON / 2:OFF	ON	OK
763	CNG detect time for friendly reception	1:10s / 2:20s / 3:30s	30s	OK
771	T1 timer	1:35s / 2:60s	35s	OK
774	T4 timer	00~99 × 100msec	00	OK
815	Sensor test	---------	---------	NG
852	Print test pattern	---------	---------	NG
853	Top margin	1~5	3	OK
854	Left margin	1~7	4	OK
874	DTMF ON time	060~200msec	90	OK
875	DTMF OFF time	060~200msec	90	OK
880	History list	1:Start	---------	NG
881	Journal 2	---------	---------	NG

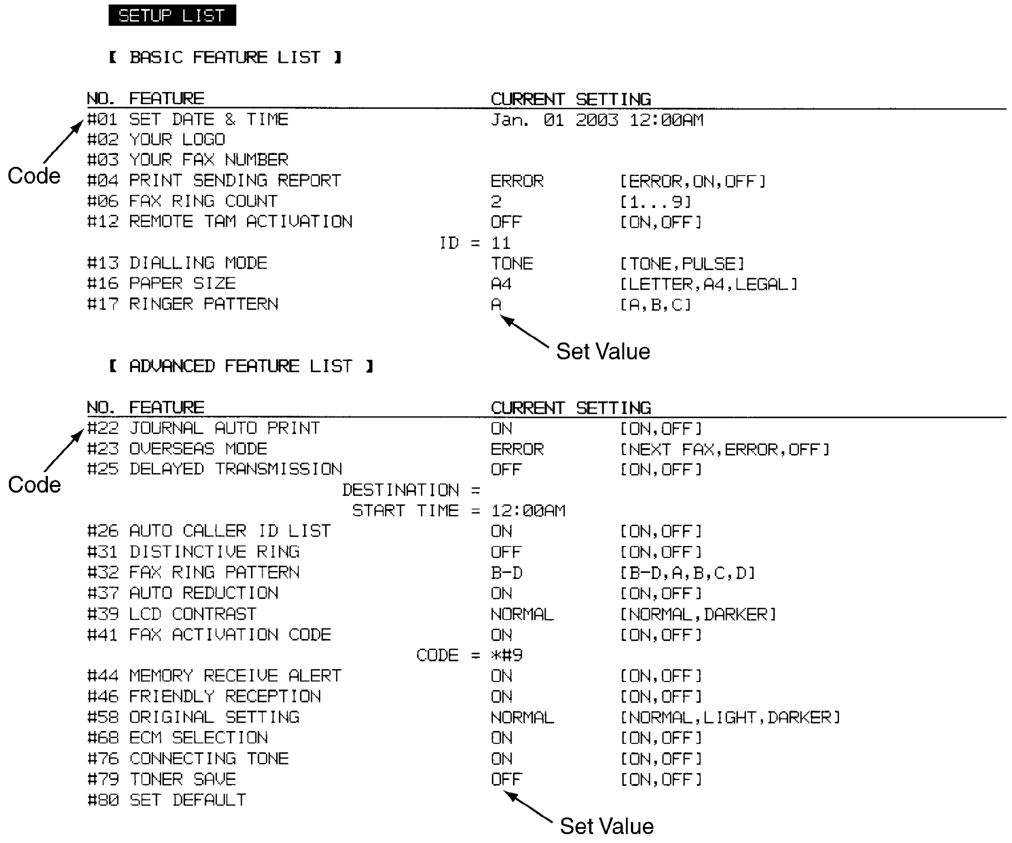
Code	Function	Set Value	Default	Remote Setting
882	Journal 3	---------	---------	NG
991	Setup list	1:Start	---------	OK
994	Journal list	1:Start	---------	OK
995	Journal 2 list	1:Start	---------	OK
996	Journal 3 list	1:Start	---------	OK
998	History list	1:Start	---------	OK
999	Service list	1:Start	---------	OK

OK means “can set”.
NG means “can not set”.

Note:
Refer to SERVICE FUNCTION TABLE () for descriptions of the individual codes.

Example:
If you want to set value in the “004 Transmission report mode”, press the dial key number 1, 2 or 3 corresponding to the Set Value you want to select. (1:ERROR/2:ON/3:OFF)

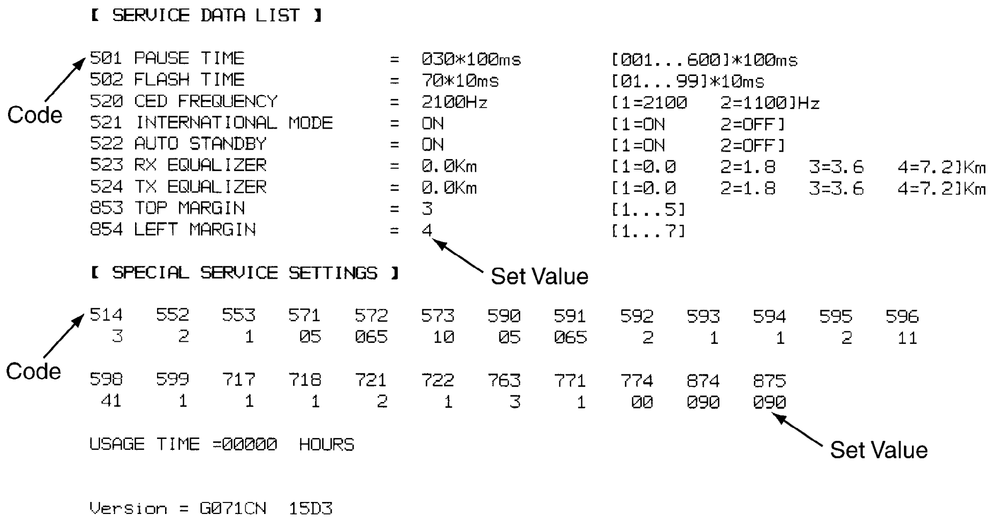
6.4.3. USER MODE (The list below is an example of the SYSTEM SETUP LIST the unit prints out.)


Code
Set Value
Code
Set Value

```
  SETUP LIST

  [ BASIC FEATURE LIST ]

NO. FEATURE                           CURRENT SETTING
#01 SET DATE & TIME                   Jan. 01 2003 12:00AM
#02 YOUR LOGO
#03 YOUR FAX NUMBER
#04 PRINT SENDING REPORT              ERROR       [ERROR,ON,OFF]
#06 FAX RING COUNT                    2           [1...9]
#12 REMOTE TAM ACTIVATION             OFF         [ON,OFF]
                                 ID = 11
#13 DIALLING MODE                     TONE        [TONE,PULSE]
#16 PAPER SIZE                        A4          [LETTER,A4,LEGAL]
#17 RINGER PATTERN                    A           [A,B,C]

  [ ADVANCED FEATURE LIST ]

NO. FEATURE                           CURRENT SETTING
#22 JOURNAL AUTO PRINT                ON          [ON,OFF]
#23 OVERSEAS MODE                     ERROR       [NEXT FAX,ERROR,OFF]
#25 DELAYED TRANSMISSION              OFF         [ON,OFF]
                        DESTINATION =
                         START TIME = 12:00AM
#26 AUTO CALLER ID LIST               ON          [ON,OFF]
#31 DISTINCTIVE RING                  OFF         [ON,OFF]
#32 FAX RING PATTERN                  B-D         [B-D,A,B,C,D]
#37 AUTO REDUCTION                    ON          [ON,OFF]
#39 LCD CONTRAST                      NORMAL      [NORMAL,DARKER]
#41 FAX ACTIVATION CODE               ON          [ON,OFF]
                               CODE = *#9
#44 MEMORY RECEIVE ALERT              ON          [ON,OFF]
#46 FRIENDLY RECEPTION                ON          [ON,OFF]
#58 ORIGINAL SETTING                  NORMAL      [NORMAL,LIGHT,DARKER]
#68 ECM SELECTION                     ON          [ON,OFF]
#76 CONNECTING TONE                   ON          [ON,OFF]
#79 TONER SAVE                        OFF         [ON,OFF]
#80 SET DEFAULT
```

Note:
The above values are the default values.

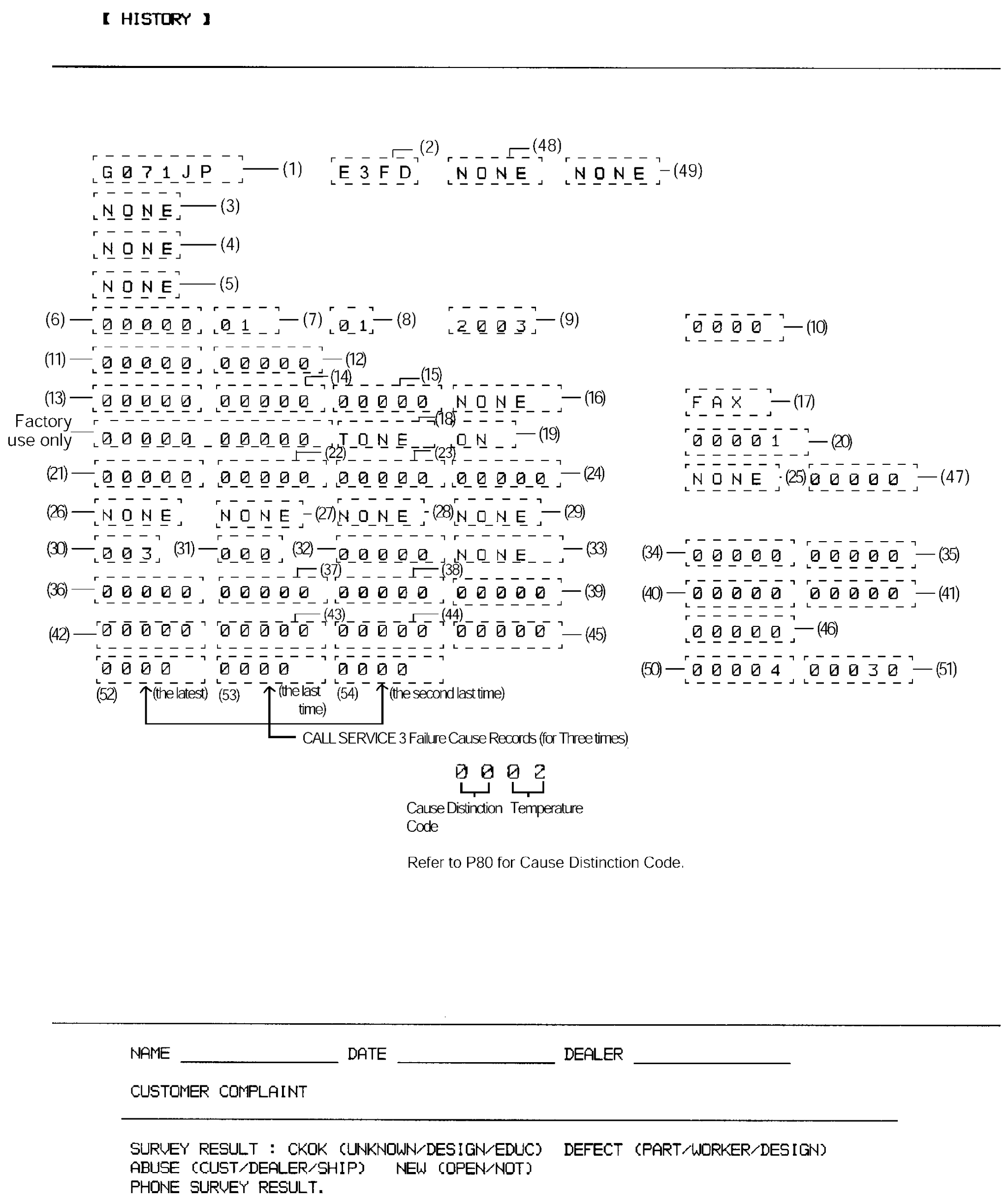
6.4.4. SERVICE MODE SETTINGS (Example of a printed out list)


Code
Set Value
Code
Set Value

```
【 SERVICE DATA LIST 】

501 PAUSE TIME              =  030*100ms        [001...600]*100ms
502 FLASH TIME              =  70*10ms          [01...99]*10ms
520 CED FREQUENCY           =  2100Hz           [1=2100   2=1100]Hz
521 INTERNATIONAL MODE      =  ON               [1=ON     2=OFF]
522 AUTO STANDBY            =  ON               [1=ON     2=OFF]
523 RX EQUALIZER            =  0.0Km            [1=0.0    2=1.8    3=3.6    4=7.2]Km
524 TX EQUALIZER            =  0.0Km            [1=0.0    2=1.8    3=3.6    4=7.2]Km
853 TOP MARGIN              =  3                [1...5]
854 LEFT MARGIN             =  4                [1...7]

【 SPECIAL SERVICE SETTINGS 】

514   552   553   571   572   573   590   591   592   593   594   595   596
  3     2     1    05   065    10    05   065     2     1     1     2    11

598   599   717   718   721   722   763   771   774   874   875
 41     1     1     1     2     1     3     1    00   090   090

USAGE TIME =00000  HOURS


Version = G071CN  15D3
```

Note:
The above values are the default values.

6.4.5. HISTORY (Example of a printed out list)


(1)
(2)
(48)
(49)
(3)
(4)
(5)
(6)
(7)
(8)
(9)
(10)
(11)
(12)
(13)
(14)
(15)
(16)
(17)
Factory use only
(18)
(19)
(20)
(21)
(22)
(23)
(24)
(25)
(47)
(26)
(27)
(28)
(29)
(30)
(31)
(32)
(33)
(34)
(35)
(36)
(37)
(38)
(39)
(40)
(41)
(42)
(43)
(44)
(45)
(46)
(50)
(51)
(52)
(the latest)
(53)
(the last time)
(54)
(the second last time)
CALL SERVICE 3 Failure Cause Records (for Three times)
Cause Distinction Code
Temperature

```
【 HISTORY 】

G071JP        E3FD   NONE   NONE
NONE
NONE
NONE
00000 01   01    2003              0000
00000 00000
00000 00000 00000 NONE             FAX
00000 00000 TONE  ON               00001
00000 00000 00000 00000            NONE  00000
NONE  NONE  NONE  NONE
003   000   00000 NONE             00000 00000
00000 00000 00000 00000            00000 00000
00000 00000 00000 00000            00000
0000  0000  0000                   00004 00030

0002

NAME ____________ DATE ____________ DEALER ____________

CUSTOMER COMPLAINT

SURVEY RESULT : CKOK (UNKNOWN/DESIGN/EDUC)  DEFECT (PART/WORKER/DESIGN)
ABUSE (CUST/DEALER/SHIP)  NEW (OPEN/NOT)
PHONE SURVEY RESULT.
```

Refer to P80 for Cause Distinction Code.

Note:

See the following descriptions of this report. Item No. (1) ~ (49) are corresponding to the listed items in DESCRIPTIONS OF THE HISTORY REPORT().

6.4.5.1. DESCRIPTIONS OF THE HISTORY REPORT

(1) ROM VERSION

FLASH ROM version

(2) SUM

FLASH ROM internal data calculation.

(3) YOUR LOGO

The user logo recorded in the unit. If it is not recorded, NONE will be displayed.

(4) YOUR TELEPHONE NUMBER

The user telephone number recorded in the unit. If it is not recorded, NONE will be displayed.
(5) Not used
(6) FACTORY - CUSTOMER
This shows how many days from factory production until the user turns ON the unit.
(7) MONTH
The shows the very first month, date, year and time set by the user after they purchased the unit.
(8) DAY
The shows the very first month, date, year and time set by the user after they purchased the unit.
(9) YEAR
The shows the very first month, date, year and time set by the user after they purchased the unit.
(10) TIME
The shows the very first month, date, year and time set by the user after they purchased the unit.
(11) USAGE TIME
The amount of time the unit has been powered ON.
(12) FACTORY - NOW
This shows how many days from factory production until the user prints out this history list.
(13) TEL MODE
The amount of time the TEL mode setting was used.
(14) FAX MODE
The amount of time the FAX mode setting was used.
(15) Not used
(16) Not used
(17) FINAL RECEIVE MODE
The last set receiving mode by the user.
(18) TONE/PULSE SELECTION
The most recently used setting used, either TONE or PULSE.
(19) RECEIVE REDUCTION
The compression rate when receiving.
(20) SETTING NO. OF DIRECTORY
The recorded directory stations (one touch dial).
(21) NUMBER OF COPY
The number of pages copied.
(22) NUMBER OF RECEIVE
The number of pages received.
(23) NUMBER OF SENDING
The number of pages sent.
(24) NUMBER OF CALLER ID
The number of times Caller ID was received.
(25) Not used
(26) Not used
(27) Not used
(28) Not used
(29) Not used
(30) Not used
(31) NUMBER OF PRINTING HELP
The number of help lists printed until now.
(32) NUMBER OF DIVIDED PRINTING IN FAX RECEPTION
The number of faxes received that were divided into more than one sheet since the unit was purchased.

(33) Not used.
(34), (35) Not used.
(36) FAX MODE
Means the unit received a fax message in the FAX mode.
(37) MAN RCV
Means the unit received a fax message by manual operation.
(38) FRN RCV
Means the unit received a fax message by friendly signal detect.
(39) Not used
(40) RMT DTMF
Means the unit detected DTMF (Remote Fax activation code) entered remotely.
(41) PAL DTMF
Means the unit detected DTMF (Remote Fax activation code) entered by a parallel connected telephone.
(42) TURN-ON
Means the unit started to receive after 10 rings. (Remote Turn On: Service Code #573)
(43) Not used
(44) IDENT
Means the unit detected Ring Detection.
(45) Not used
(46) Not used
(47) Not used
(48) Not Used
(49) Not Used
(50) Printing number of the drum unit
(51) Paddle rotation number of the drum unit
(52) CALL SERVICE 3 failure cause record (the latest)
(53) CALL SERVICE 3 failure cause record (the last time)
(54) CALL SERVICE 3 failure cause record (the second last time)

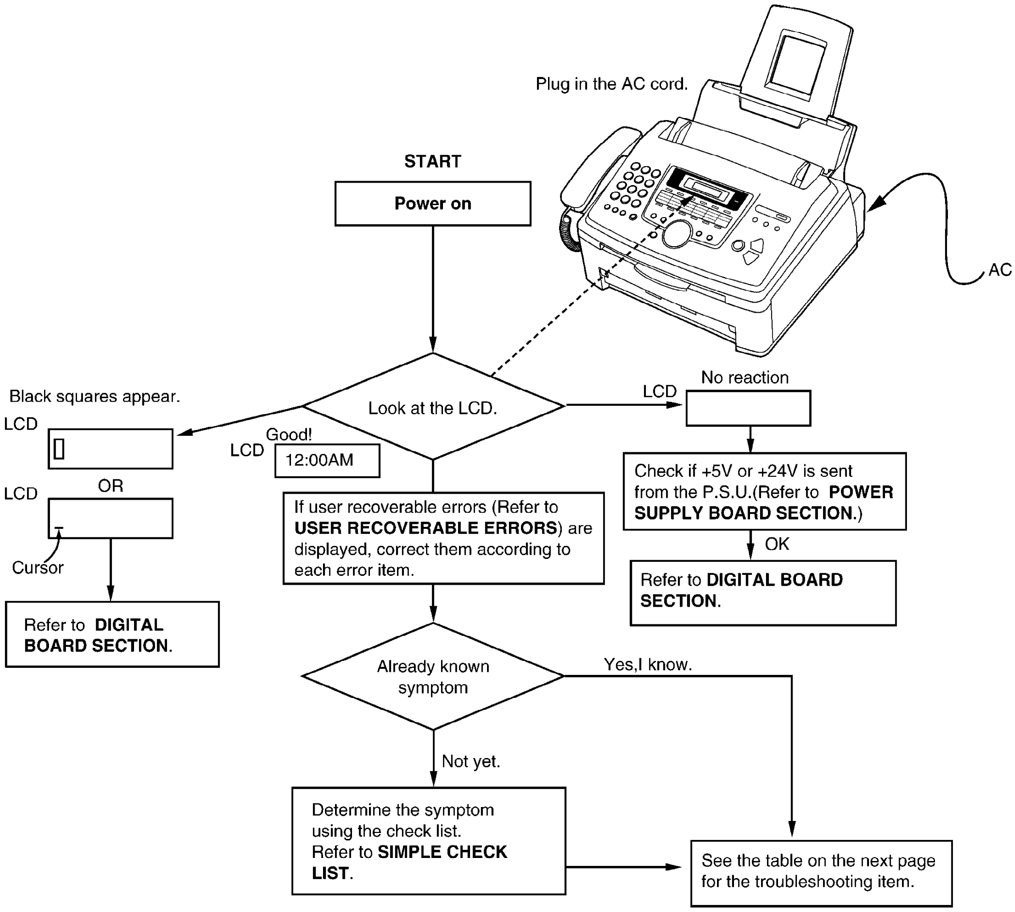
6.5. TROUBLESHOOTING DETAILS

6.5.1. OUT LINE

Troubleshooting is for recovering quality and reliability by determining the broken component and replacing, adjusting or cleaning it as required. First, determine the problem then decide the troubleshooting method. If you have difficulty finding the broken part, determine which board is broken. (For example: the Digital PCB, Analog PCB, etc.) The claim tag from a customer or dealer may use different expressions for the same problem, as they are not a technician or engineer. Using your experience, test the problem area corresponding to the claim. Also, returns from a customer or dealer often have a claim tag. For these cases as well, you need to determine the problem. Test the unit using the simple check list on SIMPLE CHECK LIST(). Difficult problems may be hard to determine, so repeated testing is necessary.

6.5.2. STARTING TROUBLE SHOOTING

Determine the symptom and the troubleshooting method.


Plug in the AC cord.
AC
START
Power on
Look at the LCD.
Black squares appear.
LCD
OR
LCD
Cursor
Refer to DIGITAL BOARD SECTION.
Good!
LCD
12:00AM
No reaction
LCD
Check if +5V or +24V is sent from the P.S.U.(Refer to POWER SUPPLY BOARD SECTION.)
OK
Refer to DIGITAL BOARD SECTION.
If user recoverable errors (Refer to USER RECOVERABLE ERRORS) are displayed, correct them according to each error item.
Already known symptom
Yes,I know.
Not yet.
Determine the symptom using the check list. Refer to SIMPLE CHECK LIST.
See the table on the next page for the troubleshooting item.

CROSS REFERENCE:

USER RECOVERABLE ERRORS()

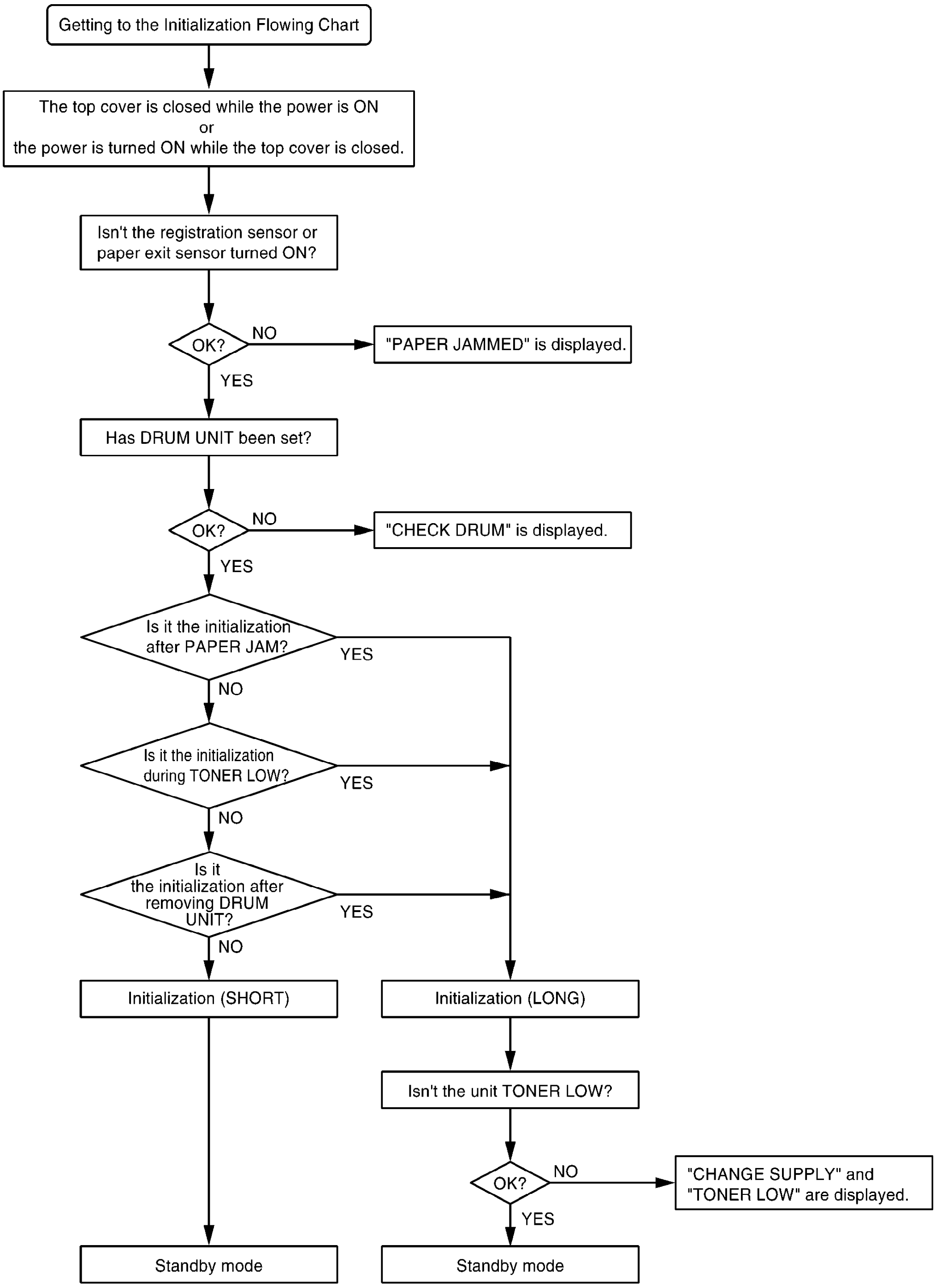
SIMPLE CHECK LIST()

DIGITAL BOARD SECTION()

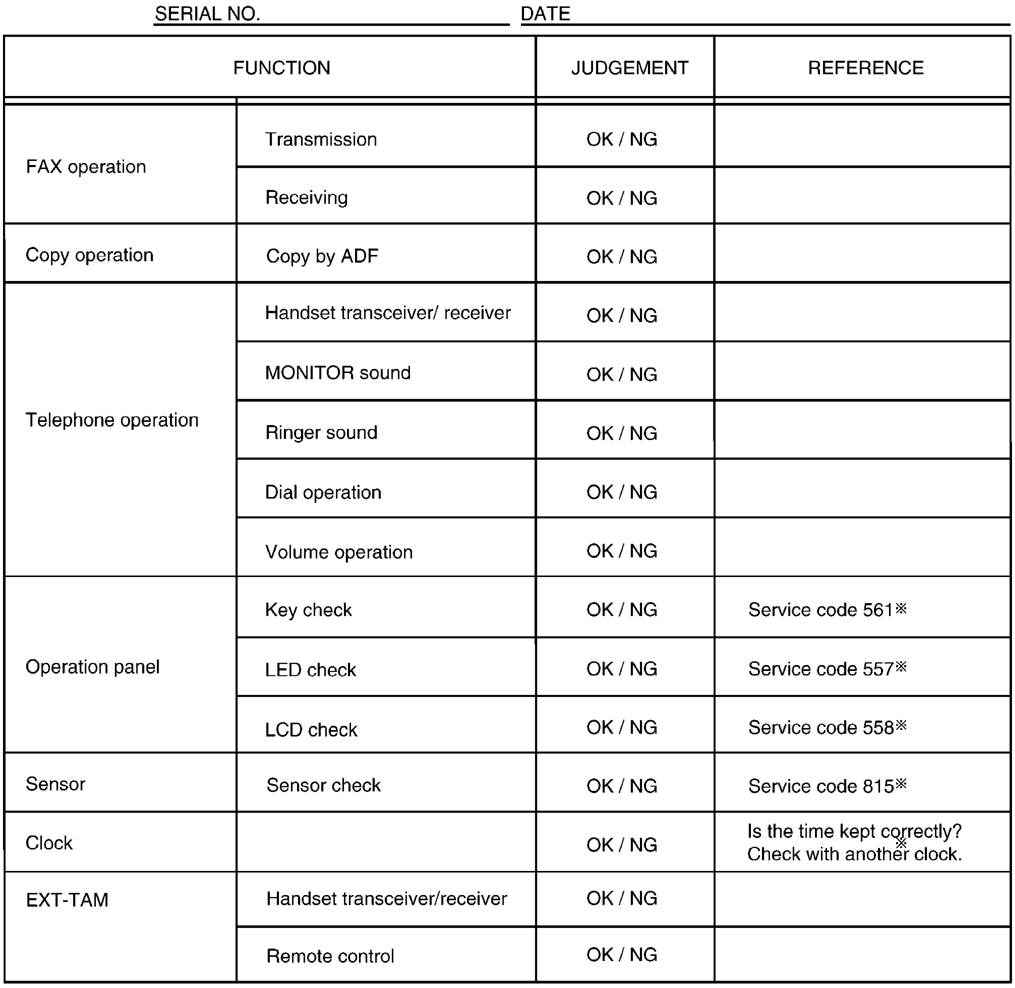
POWER SUPPLY BOARD SECTION()

6.5.3. INITIALIZATION

There are two types of initialization, one is the short initialization (about 3 seconds) and the other is the long initialization (about 10 seconds). The short initialization makes the unit enter the standby mode. The long initialization makes the unit enter the standby mode after cleaning or detecting the rest of toner.


Getting to the Initialization Flowing Chart
The top cover is closed while the power is ON
or
the power is turned ON while the top cover is closed.
Isn't the registration sensor or paper exit sensor turned ON?
OK?
NO
"PAPER JAMMED" is displayed.
YES
Has DRUM UNIT been set?
OK?
NO
"CHECK DRUM" is displayed.
YES
Is it the initialization after PAPER JAM?
YES
NO
Is it the initialization during TONER LOW?
YES
NO
Is it the initialization after removing DRUM UNIT?
YES
NO
Initialization (SHORT)
Initialization (LONG)
Isn't the unit TONER LOW?
OK?
NO
"CHANGE SUPPLY" and "TONER LOW" are displayed.
YES
Standby mode
Standby mode

6.5.4. SIMPLE CHECK LIST



SERIAL NO. ____________ DATE ____________

FUNCTION		JUDGEMENT	REFERENCE
FAX operation	Transmission	OK / NG	
	Receiving	OK / NG	
Copy operation	Copy by ADF	OK / NG	
Telephone operation	Handset transceiver/ receiver	OK / NG	
	MONITOR sound	OK / NG	
	Ringer sound	OK / NG	
	Dial operation	OK / NG	
	Volume operation	OK / NG	
Operation panel	Key check	OK / NG	Service code 561※
	LED check	OK / NG	Service code 557※
	LCD check	OK / NG	Service code 558※
Sensor	Sensor check	OK / NG	Service code 815※
Clock		OK / NG	Is the time kept correctly?※ Check with another clock.
EXT-TAM	Handset transceiver/receiver	OK / NG	
	Remote control	OK / NG	

Note:

Check according to the service code referring to TEST FUNCTIONS ()

6.5.5. SIMPLIFIED TROUBLESHOOTING GUIDE

6.5.5.1. PRINTING

No.	Symptom	Cause	Countermeasure
1	GHOST IMAGE ()	Failed drum unit	Replace drum unit
		Failed transfer unit	Check the transfer roller and spring
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to HIGH VOLTAGE SECTION ()
		Failed fuser unit	Check the heat roller and the pressur roller and the spring and the heat lam thermistor
		Failed the power supply board	Go to POWER SUPPLY BOARD SECT
		Too thick or too thin recording paper	Use the recording paper from 16lb to
2	DARK OR WHITE VERTICAL LINE ()	Dirty the lower glass or the reflecting mirror	Clean the lower glass and the reflecti
		Dust on the path of the laser beam	Clean the path of the laser beam
		Dust on the developer roller	Replace drum unit
		Failed the heat roller or the pressuizedr roller	Check the heat roller and the pressur
		Failed LSU	Go to LSU SECTION ()
3	DARK OR WHITE HORIZONTAL LINE ()	Failed drum unit	Replace drum unit
		Failed the gear	Check the gear
		Failed the engine motor	Go to ENGINE MOTOR ()
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to HIGH VOLTAGE SECTION ()
		Scratch on the OPC drum	Replace drum unit
		Static electricity on the documents (when copying)	Check the connection between the pa around CIS and earth
4	DIRTY OR HALF DARKNESS BACKGROUND ()	Failed drum unit	Replace drum unit
		Life of drum unit is over	Replace drum unit
		Dirty the pickup roller and the regist roller and the feed roller and the eject roller and the heat roller and the pressure roller	Clean the pickup roller and the regist and the feed roller and the eject rolle heat roller and the pressure roller
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to HIGH VOLTAGE SECTION ()
		Dirty the recording paper path	Clean the recording paper path
5	BLACK PRINT ()	Failed drum unit	Replace drum unit
		Failed LSU	Go to LSU SECTION ()
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to HIGH VOLTAGE SECTION ()
		Failed the digital board	Check the digital board
		Failed CIS (when copying)	Go to CIS (Contact Image Sensor) SE

No.	Symptom	Cause	Countermeasure
6	LIGHT PRINT ()	Short toner	Supply toner
		Failed drum unit	Replace drum unit
		Life of drum unit is over	Replace drum unit
		Dirty the lower glass or the reflecting mirror	Clean the lower glass and the reflecti
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to HIGH VOLTAGE SECTION ()
7	BLACK DENSITY IS LIGHT OR UNEVEN()	Short toner	Supply toner
		Failed drum unit	Replace drum unit
		Life of drum unit is over	Replace drum unit
		Dirty the lower glass or the reflecting mirror	Clean the lower glass and the reflecti
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to HIGH VOLTAGE SECTION ()
8	BLANK PRINT ()	Failed drum unit	Replace drum unit
		Failed LSU	Go to LSU SECTION ()
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to HIGH VOLTAGE SECTION ()
		Failed the digital board	Check the digital board
		Failed CIS (when copying)	Go to CIS (Contact Image Sensor) SE
9	BLACK OR WHITE POINT ()	Failed the developer roller (31.4mm pitch)	Replace drum unit
		Failed the OPC drum (75.4mm pitch)	Replace drum unit
		Failed the heat roller (62.8mm pitch)	Check the heat roller
		Failed the charge blush (21mm pitch)	Replace drum unit
		Failed the high voltage power supply board	Go to HIGH VOLTAGE SECTION ()
		Too thick or too thin recording paper	Use the recording paper from 16lb to

6.5.5.2. RECORDING PAPER FEED

No.	Symptom	Cause	Countermeasure
1	MULTIPLE FEED ()	Dirty or failed the pickup roller	Clean or replace the pickup roller
		Dirty or failed the pickup rubber	Clean or replace the separation rubb
2	THE RECORDING PAPER IS WAVED OR WRINKLED ()	Dirty the pressure roller or the heat roller	Clean the pressure roller and the hea
		Failed the spring of pressure roller	Replace the spring of pressure roller
		Too thin recording paper	Use the recording paper from 16lb to
3	SKEW ()	Dirty or failed the pickup roller	Clean or replace the pickup roller
		Dirty or failed the pickup rubber	Clean or replace the separation rubb
		Dirty or failed the paper feed roller	Clean or replace the regist roller
		Dust on the recording paper path	Clean the recording paper path
		Failed LSU	Replace LSU
		Over the max capacity of the recording paper	Set up to MAX 150 sheets
		Too thick or too thin recording paper	Use the recording paper from 16lb to
4	THE RECORDING PAPER DOES NOT FEED ()	Dirty or failed the pickup roller	Clean or replace the pickup roller
		Dirty or failed the pickup rubber	Clean or replace the separation rubb
		Failed the gear	Check the gear
		Failed the engine motor	Go to ENGINE MOTOR ()
		Failed the paper feed sensor lever	Check the regist sensor (paper top s lever
		Failed the paper feed sensor	-----
5	THE RECORDING PAPER JAM()” PAPER JAMMED” ON THE LCD	Dirty or failed the pressure roller	Clean or replace the pressure roller
		Dirty or failed the heat roller	Clean or replace the heat roller
		Dust on the recording paper path	Clean the recording paper path
		Failed the paper feed roller	Replace the regist roller
		Failed the gear	Check the gear
		Failed the engine motor	Go to ENGINE MOTOR ()
		Failed the paper feed sensor lever	Check the regist sensor (paper top s lever
		Failed the paper feed sensor	-----
		Failed the exit sensor lever	Check the exit sensor lever
		Failed the exit sensor	Go to PAPER EXIT SENSOR..... “PAP JAMMED” ()
		Too thick or too thin recording paper	Use the recording paper from 16lb to
		Not set the toner bottle	Set toner bottle
6	BACK SIDE OF THE RECORDING PAPER IS DIRTY()	Dirty the recording paper path	Clean the recording paper path
		Dirty the pressure roller	Clean the pressure roller
		Dirty the regist roller	Clean the regist roller
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to HIGH VOLTAGE SECTION ()

6.5.5.3. COPY AND FAX

No.	Symptom	Cause	Countermeasure
1	NO DOCUMENT FEED (NO DOCUMENT FEED,DOCUMENT JAM and MULTIPLE DOCUMENT FEED.) ()	Failed the document sensor lever	Replace the document sensor lever
		Failed the document sensor	Go to DOCUMENT SENSOR (P.161)
		Dirty or failed the separation roller	Clean or replace the separation roller
		Dirty or failed the separation rubber	Clean or replace the separation rubb
		Failed the separation spring	Replace the separation spring
	DOCUMENT JAM (NO DOCUMENT FEED,DOCUMENT JAM and MULTIPLE DOCUMENT FEED.) ()	Dust or scratch on the document paper path	Clean the document paper path
		Failed the gear	Check the gear
		Failed the ADF motor	Go to ADF MOTOR ()
		Failed the ADF cover open switch lever	Replace the ADF cover open switch l
	MULTIPLE DOCUMENT FEED (NO DOCUMENT FEED,DOCUMENT JAM and MULTIPLE DOCUMENT FEED.) ()	Dirty or failed the separation roller	Clean or replace the separation roller
		Dirty or failed the separation rubber	Clean or replace the separation rubb
		Failed the separation spring	Replace the separation spring
2	SKEW (ADF) ()	Dust or scratch on the document paper path	Clean the document paper path
		Failed the document feed roller	Replace the document feed roller
		Failed the document guide	Replace the document guide
3	THE SENT FAX DATA IS SKEWED ()	The cause of ADF	Go to SKEW (ADF)()
		The cause of scanner glass	----
		Problem with the other FAX machine	
4	THE RECEIVED FAX DATA IS SKEWED ()	The cause of printing	Go to SKEW (ADF)()
		Problem with the other FAX machine	
5	THE RECEIVED OR COPIED DATA IS EXPANDED ()	Dirty or failed the drive roller (at ADF)	Clean or replace the drive roller
		Dirty or failed the document feed roller (at ADF)	Clean or replace the document feed r
		Dirty or failed the separation roller (at ADF)	Clean or replace the separation roller
		Failed CIS movement (at SG)	Replace the belt or the gear or the sh ADF motor
6	BLACK OR WHITE VERTICAL LINE IS COPIED ()	Dirty or failed the white plate (2 places)	Clean or replace the white plate
		Dirty or failed the glass board	Clean or replace the glass board
		The cause of printing	Go to DARK OR WHITE VERTICAL LI
		Failed CIS	Go to CIS (Contact Image Sensor) SE

No.	Symptom	Cause	Countermeasure
7	AN ABNORMAL IMAGE IS COPIED ()	Dirty or failed the white plate (2 places)	Clean or replace the white plate
		Dirty or failed the glass board	Clean or replace the glass board
		Dirty or failed the drive roller (at ADF)	Clean or replace the drive roller
		Dirty or failed the document feed roller (at ADF)	Clean or replace the document feed r
		Dirty or failed the separation roller (at ADF)	Clean or replace the separation roller
		Failed CIS movement (at SG)	Replace the belt or the gear or the sh ADF motor
		Failed CIS	Go to CIS (Contact Image Sensor) SE
		The cause of printing	Go to DARK OR WHITE VERTICAL LI

6.5.5.4. Others

No.	Symptom	Cause	Countermeasure
1	Cannot print legal size	Not selected the legal mode	Select the legal mode in the user programming mode
2	'CHECK DRUM' on the LCD	The drum unit can not be detected. -Drum Sensor trouble -Mechanical shutter trouble	Go to DRUM SENSOR () Go to LSU (Laser Scanning Unit) SEC
3	'CHANGE DRUM' on the LCD	The toner sensor cannot detect the toner sensor signal.	Go to TONER SENSOR.... "TONER EM "TONER LOW", "CHANGE DRUM" ()
4	'OUT OF PAPER' on the LCD	Failed the paper sensor lever	Replace the paper sensor lever
		Failed the paper sensor	Go to PAPER SENSOR..... "OUT OF P
5	'COVER OPEN' on the LCD	Failed the top cover open switch lever	Replace the top cover open switch le
		Failed the top cover open switch	Go to TOP COVER OPEN SWITCH ()
6	CALL SERVICE 1' on the LCD	The polygon motor of LSU is unusually	Check the connector and LSU and th board
7	CALL SERVICE 2' on the LCD	The laser of LSU is unusually	Check the connector and LSU and th board
8	CALL SERVICE 3' on the LCD	The fuser temperature is unusually	Check the connector and the fuser ar thermistor and the digital board
9	CALL SERVICE 4' on the LCD	The fan motor is unusually	Check the connector and the fan mot the digital board

6.5.6. CALL SERVICE TROUBLESHOOTING GUIDE

Call Service related error is most frequent.
Call Service 1 ----- Polygon doesn't rotate......... Refer to LSU (Laser Scanning Unit) SECTION ().

- First, listen to the sound. If rotation sound isn't heard, check 24V line, POLON signal and POLCLK signal. If even a little of sound is

heard, check XREADY signal.

Call Service 2 ----- Laser isn't output.......... Refer to LSU (Laser Scanning Unit) SECTION ()

- This can be judged only by referring to signal. Check 5V line, XHSYNC, SPC, VIDEO, LDON.

Call Service 3 ----- Detection of fixing temperature.......... Refer to HEAT LAMP CONTROL CIRCUIT ()

- *Service mode *655 tells the detection number and 3 latest temperatures of the thermistor. The detection point of the Call Service 3 and the thermistor temperature is displayed. Maximum 3 latest temperatures are displayed showing the newest on the left. [AABB CCDD EEFF] AA, CC and EE show the detection points and BB, DD and FF show their temperature detection points.

  0: means that CALL SERVICE 3 has not been appeared.

  1: means that it did not reach 56°C within 22 seconds since the heater was turned ON.

  3: means that it did not reach the secondary stabilizing temperature (160°C) within 35 seconds from 56°C.

  4: means that it became T2-40deg (120°C or below) after T2; the secondary stabilizing temperature (160°C). (The heater has burnt out.)

  5: means that it became over 220°C.

  6: means that during printing the SHORT of the thermistor (AD: 01h or below) was detected.

  7: means that the thermistor's SHORT (AD:00h) and OPEN (AD: F9h or over) were detected.

Call Service 4 ----- Rotation of Fan.......... Refer to FAN MOTOR SECTION ()

- Connector isn’t inserted firmly, dust is caught in and the fan is broken.

  * As for Call Services 1, 2 and 4, turn the power OFF then ON to restart.

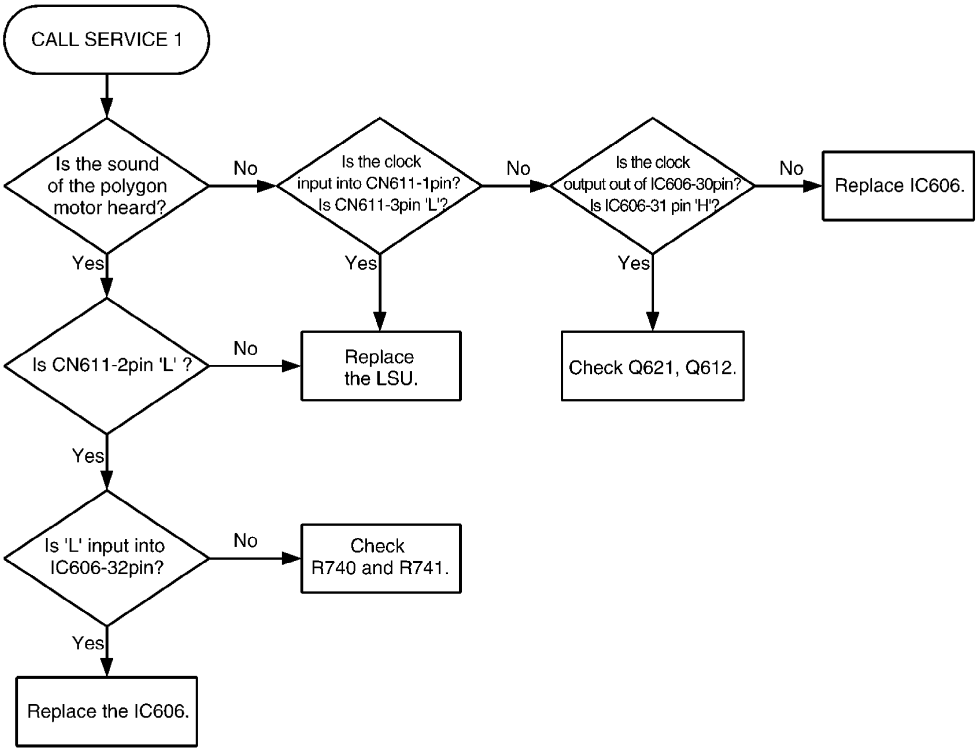
<Note>

Once “CALL SERVICE3” is displayed, the unit does not disappear until the Factory Setup or Servi
Function #529 is executed.
Therefore Service Function #529 should be executed before the confirmation, and #529 should be
the countermeasure.

6.5.6.1. CALL SERVICE 1

**"CALL SERVICE 1" means that the polygon motor inside the LSU does not rotate.
The rotation of the polygon motor is detected by IC606-32pin (XREADY).**

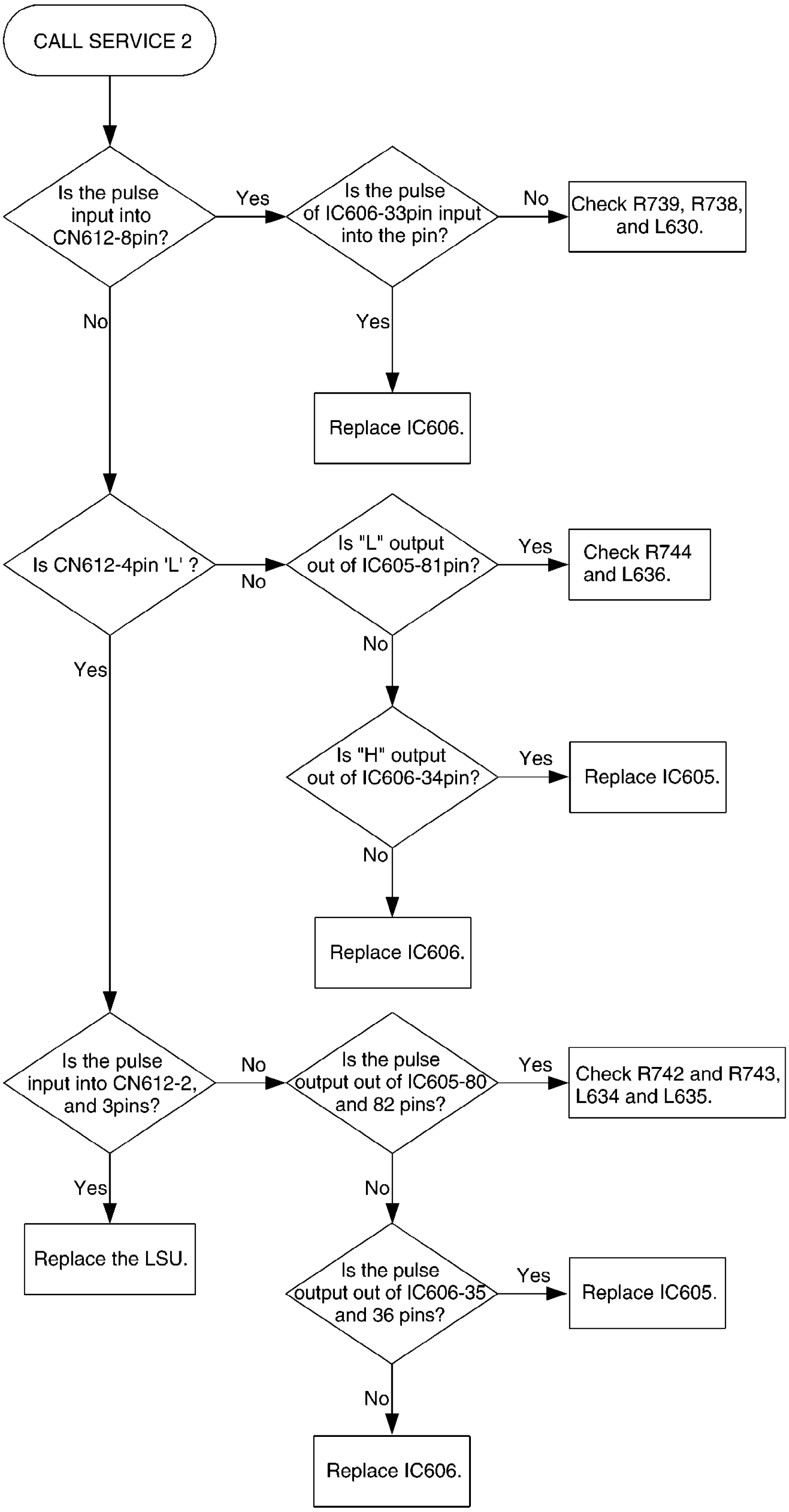
After the LCD indicates "CALL SERVICE 1 ", turn the power OFF/ON.
Then, when the unit starts initial operation, confirm that the rotating sound of the polygon motor is heard before the engine motor starts to run.


CALL SERVICE 1
Is the sound of the polygon motor heard?
No
Is the clock input into CN611-1pin? Is CN611-3pin 'L'?
No
Is the clock output out of IC606-30pin? Is IC606-31 pin 'H'?
No
Replace IC606.
Yes
Yes
Yes
Is CN611-2pin 'L' ?
No
Replace the LSU.
Check Q621, Q612.
Yes
Is 'L' input into IC606-32pin?
No
Check R740 and R741.
Yes
Replace the IC606.

6.5.6.2. CALL SERVICE 2

**"CALL SERVICE 2" means that the synchronous signal out of the LSU cannot be detected.
The synchronous signal out of the LSU is detected by IC 606-33pin. (XHSYNC)**

After the LCD indicates "CALL SERVICE 2 ", turn the power ON/OFF, then confirm the waveform when theunit starts initial operation.

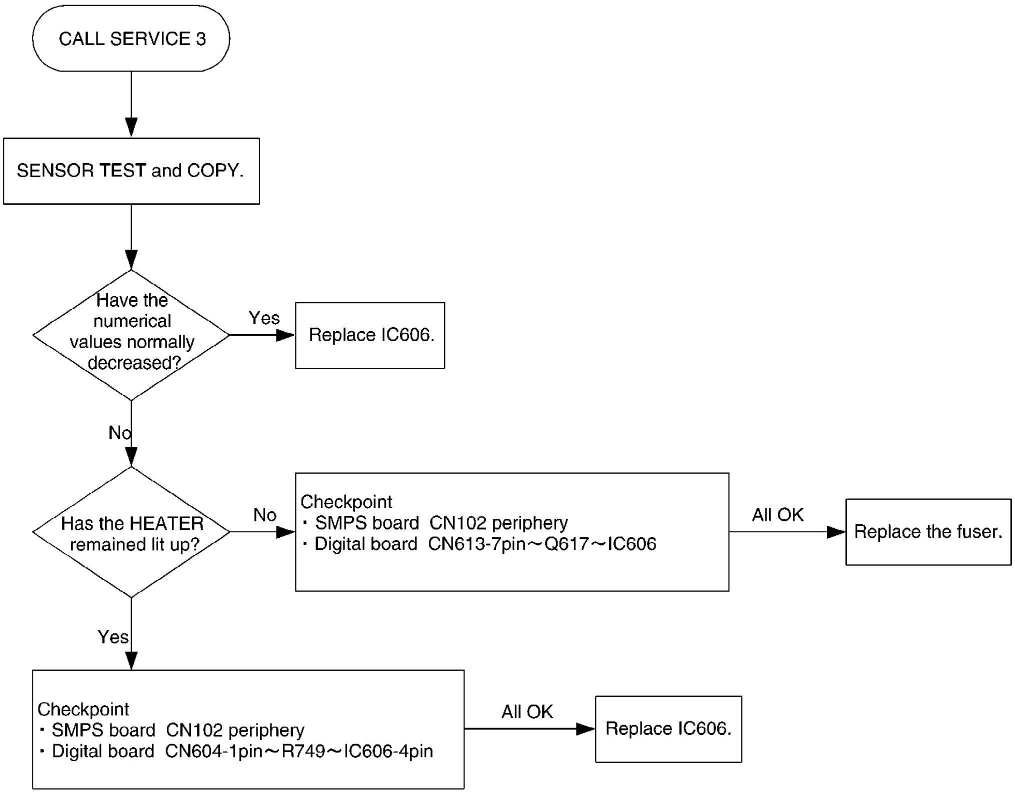

CALL SERVICE 2
Is the pulse input into CN612-8pin?
Yes
Is the pulse of IC606-33pin input into the pin?
No
Check R739, R738, and L630.
Yes
Replace IC606.
No
Is CN612-4pin 'L' ?
No
Is "L" output out of IC605-81pin?
Yes
Check R744 and L636.
No
Is "H" output out of IC606-34pin?
Yes
Replace IC605.
No
Replace IC606.
Yes
Is the pulse input into CN612-2, and 3pins?
No
Is the pulse output out of IC605-80 and 82 pins?
Yes
Check R742 and R743, L634 and L635.
Yes
Replace the LSU.
No
Is the pulse output out of IC606-35 and 36 pins?
Yes
Replace IC605.
No
Replace IC606.

Note:
As for the "Pulse" waveform of the above flow chart, see the timing chart.

6.5.6.3. CALL SERVICE 3

"CALL SERVICE 3" means that the temperature of the fuser does not rise up to or exceed a constant temperature.
The temperature is monitored with the thermistor inside the fuser and detected with the voltage input into IC 606-4pin.

After the LCD indicate "CALL SERVICE 3" , perform the MENU →#→ 9000 → *529. Then, turn the power OFF/ON.
Perform the SENSOR TEST in service mode.
SENSOR TEST can be performed by pressing MENU→ # → 9000→ *815.
In this state, perform the copy operation to confirm how the two-digit numbers on the LCD change. In normal times, 'DF(25°C)' is displayed in the waiting state, and '60(160°C)' or its approximate numbers are displayed during printing.


CALL SERVICE 3
SENSOR TEST and COPY.
Have the numerical values normally decreased?
Yes
Replace IC606.
No
Has the HEATER remained lit up?
No
Checkpoint
・SMPS board CN102 periphery
・Digital board CN613-7pin～Q617～IC606
All OK
Replace the fuser.
Yes
Checkpoint
・SMPS board CN102 periphery
・Digital board CN604-1pin～R749～IC606-4pin
All OK
Replace IC606.

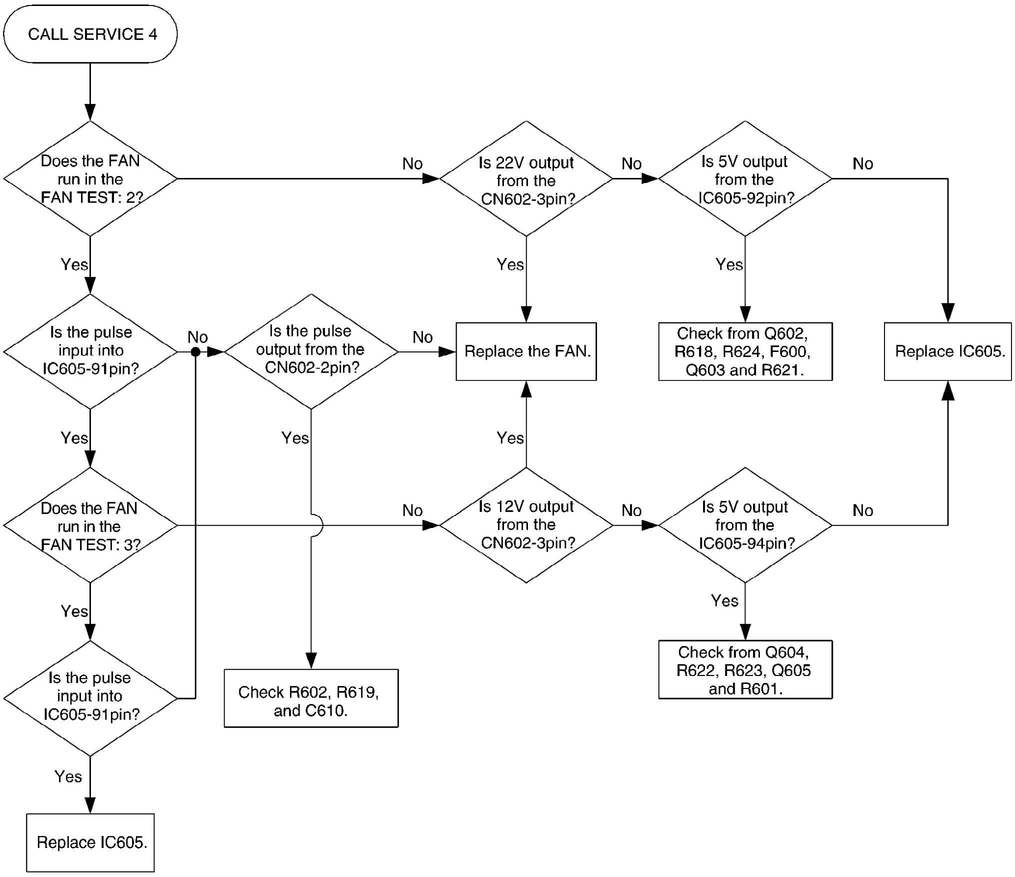
***When Call Service 3 is occurred, the cause can be distinguished.**
Refer to page 80 for details.

6.5.6.4. CALL SERVICE 4

"CALL SERVICE 4" means that the FAN does not run or the running of the FAN cannot be detected normally.
The running of the FAN is detected by IC 605-91pin. "CALL SERVICE 4" is displayed when it detects NG five times continuously.
After repairing, copy five times.If “CALL SERVICE 4 “ is displayed,check again.

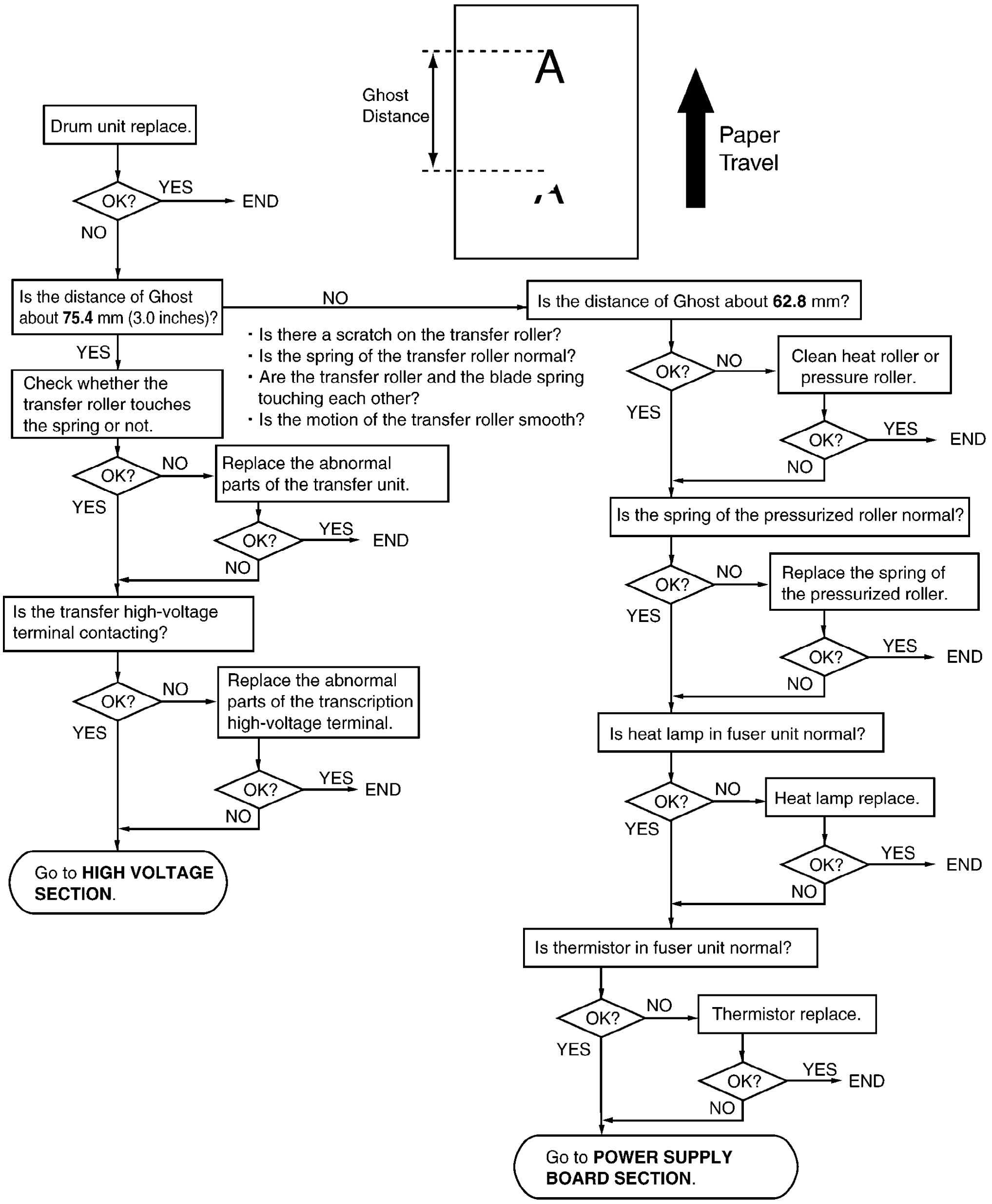
After the LCD indicates "CALL SERVICE 4 " , turn the power OFF/ON.
Then, perform the FAN TEST in service mode.
This can be performed by pressing MENU→#→9000→*677.

1: OFF (Default)
2: ON (High Speed)
3: ON (Low Speed)


CALL SERVICE 4
Does the FAN run in the FAN TEST: 2?
No
Yes
Is 22V output from the CN602-3pin?
No
Yes
Is 5V output from the IC605-92pin?
No
Yes
Is the pulse input into IC605-91pin?
No
Yes
Is the pulse output from the CN602-2pin?
No
Yes
Replace the FAN.
Check from Q602, R618, R624, F600, Q603 and R621.
Replace IC605.
Does the FAN run in the FAN TEST: 3?
No
Yes
Is 12V output from the CN602-3pin?
No
Yes
Is 5V output from the IC605-94pin?
No
Yes
Is the pulse input into IC605-91pin?
Yes
Check R602, R619, and C610.
Check from Q604, R622, R623, Q605 and R601.
Replace IC605.

6.5.7. PRINT

6.5.7.1. GHOST IMAGE

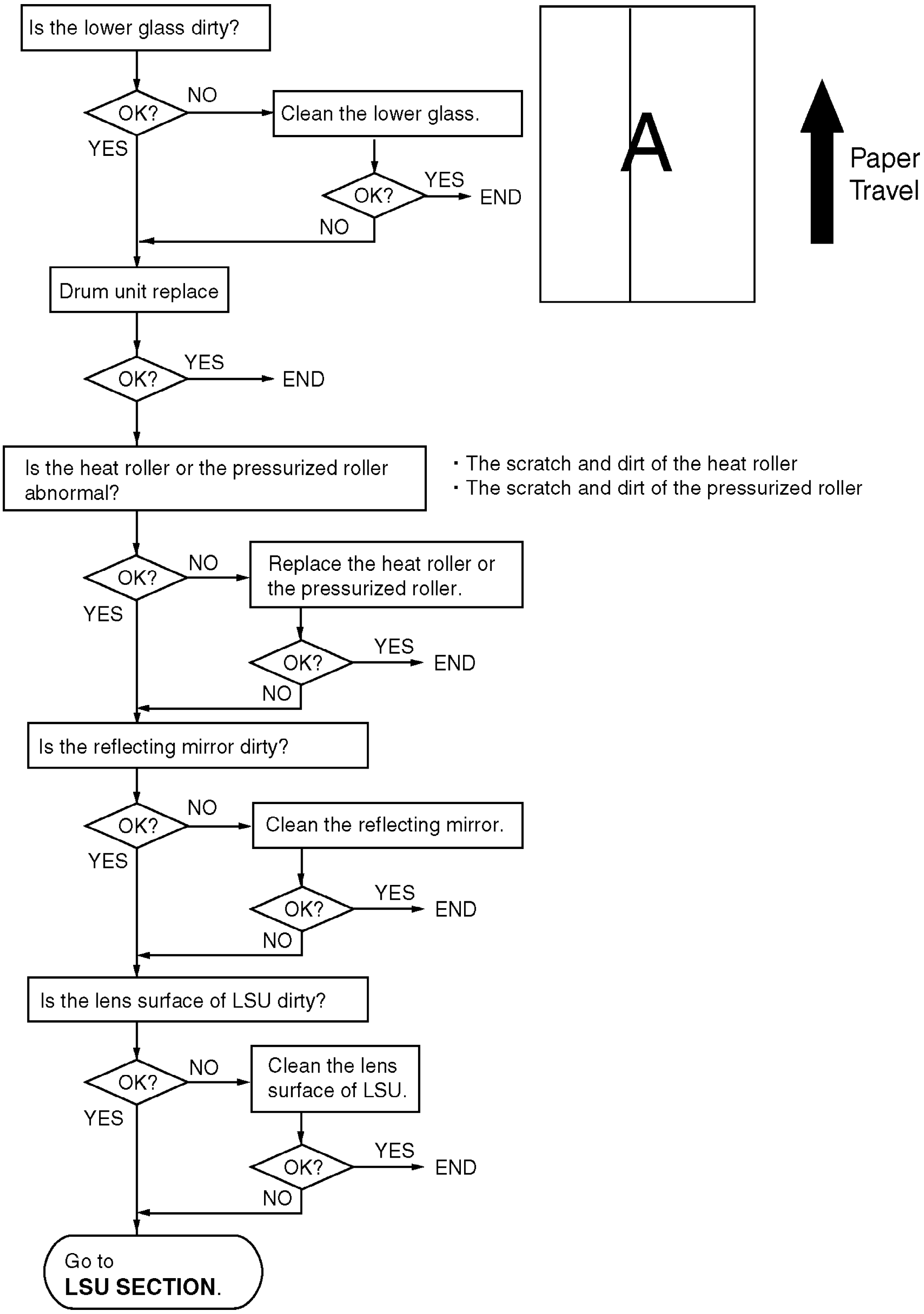

Ghost
Distance
A
Paper
Travel
Drum unit replace.
OK?
YES
END
NO
Is the distance of Ghost about 75.4 mm (3.0 inches)?
NO
Is the distance of Ghost about 62.8 mm?
YES
Check whether the transfer roller touches the spring or not.
· Is there a scratch on the transfer roller?
· Is the spring of the transfer roller normal?
· Are the transfer roller and the blade spring touching each other?
· Is the motion of the transfer roller smooth?
Replace the abnormal parts of the transfer unit.
Is the transfer high-voltage terminal contacting?
Replace the abnormal parts of the transcription high-voltage terminal.
Go to HIGH VOLTAGE SECTION.
Clean heat roller or pressure roller.
Is the spring of the pressurized roller normal?
Replace the spring of the pressurized roller.
Is heat lamp in fuser unit normal?
Heat lamp replace.
Is thermistor in fuser unit normal?
Thermistor replace.
Go to POWER SUPPLY BOARD SECTION.

CROSS REFERENCE:

HIGH VOLTAGE SECTION()

POWER SUPPLY BOARD SECTION()

6.5.7.2. DARK OR WHITE VERTICAL LINE


Is the lower glass dirty?
OK?
NO
Clean the lower glass.
YES
OK?
YES
END
NO
Drum unit replace
OK?
YES
END
Is the heat roller or the pressurized roller abnormal?
· The scratch and dirt of the heat roller
· The scratch and dirt of the pressurized roller
OK?
NO
Replace the heat roller or the pressurized roller.
YES
OK?
YES
END
NO
Is the reflecting mirror dirty?
OK?
NO
Clean the reflecting mirror.
YES
OK?
YES
END
NO
Is the lens surface of LSU dirty?
OK?
NO
Clean the lens surface of LSU.
YES
OK?
YES
END
NO
Go to
LSU SECTION.
A
Paper
Travel

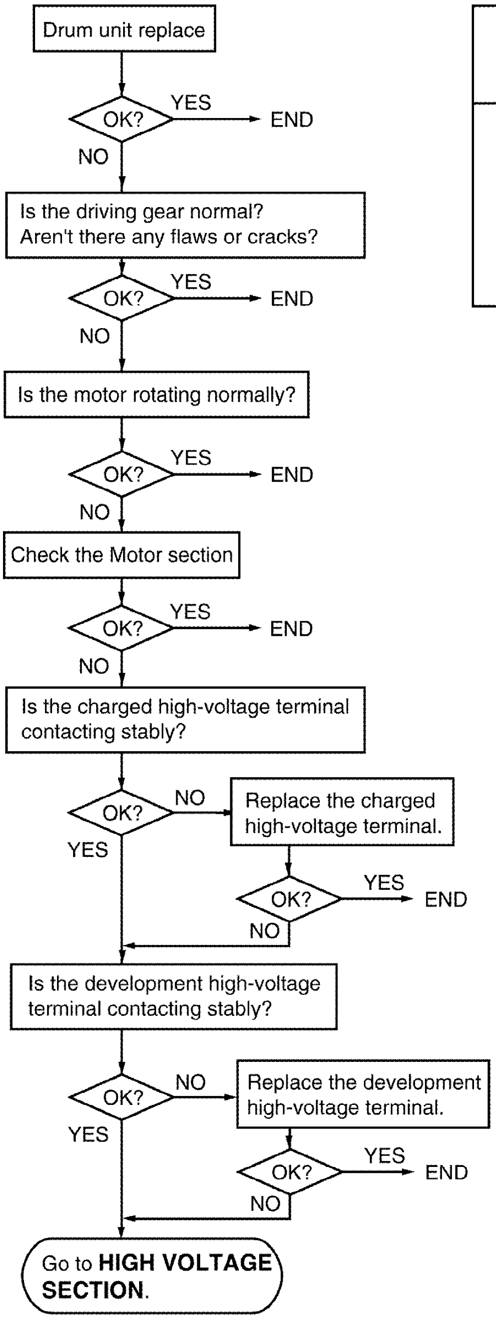
Note:

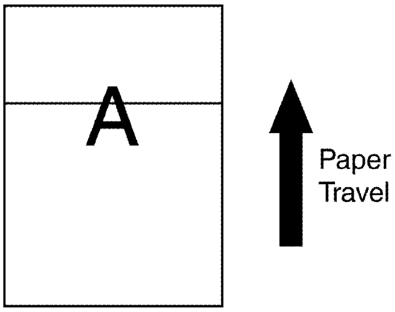
When wiping the lower glass, reflecting mirror and LSU lens, use a dry and soft cloth.

CROSS REFERENCE:

LSU SECTION ()

6.5.7.3. DARK OR WHITE HORIZONTAL LINE

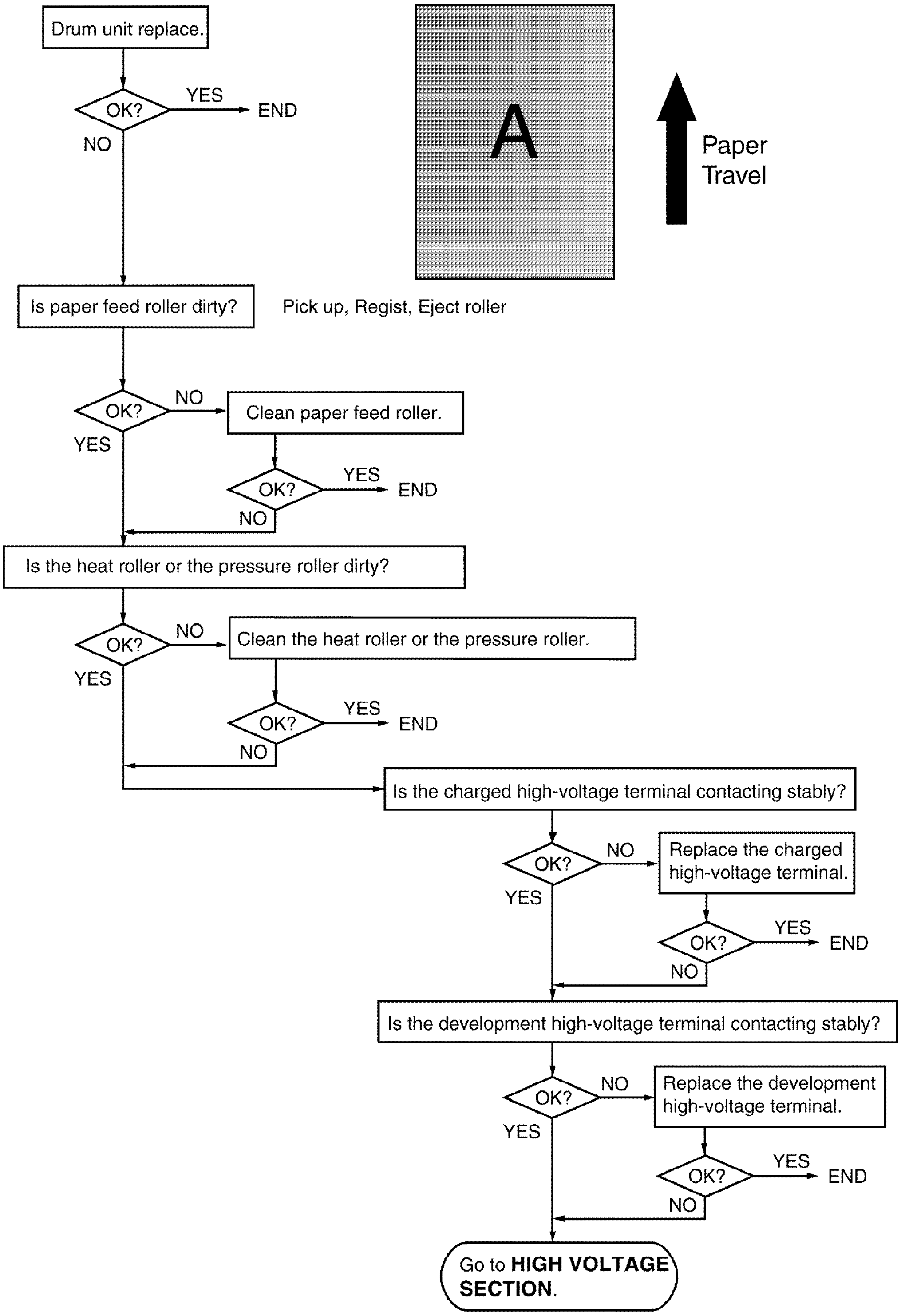

Drum unit replace
OK?
YES
END
NO
Is the driving gear normal?
Aren't there any flaws or cracks?
OK?
YES
END
NO
Is the motor rotating normally?
OK?
YES
END
NO
Check the Motor section
OK?
YES
END
NO
Is the charged high-voltage terminal contacting stably?
OK?
NO
Replace the charged high-voltage terminal.
YES
OK?
YES
END
NO
Is the development high-voltage terminal contacting stably?
OK?
NO
Replace the development high-voltage terminal.
YES
OK?
YES
END
NO
Go to HIGH VOLTAGE SECTION.


A
Paper
Travel

- It is necessary to describe the information about the lines that cannot be troubleshooted in such as halftone.
- When there is the information about the troubleshooted horizontal line, please add the description of it.

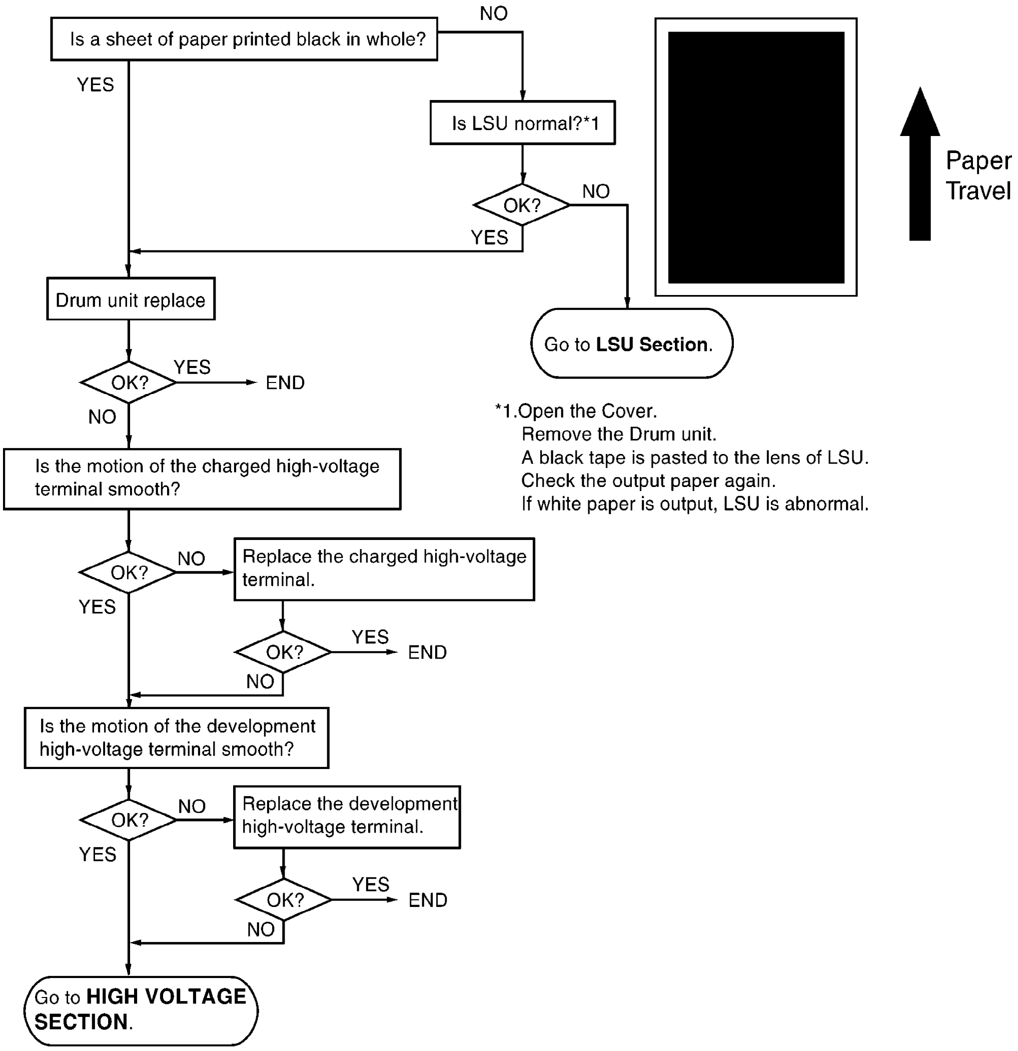
CROSS REFERENCE:
HIGH VOLTAGE SECTION ()

6.5.7.4. DIRTY OR HALF DARKNESS BACKGROUND


Drum unit replace.
OK?
YES
END
NO
A
Paper Travel
Is paper feed roller dirty?
Pick up, Regist, Eject roller
OK?
NO
Clean paper feed roller.
YES
OK?
YES
END
NO
Is the heat roller or the pressure roller dirty?
OK?
NO
Clean the heat roller or the pressure roller.
YES
OK?
YES
END
NO
Is the charged high-voltage terminal contacting stably?
OK?
NO
Replace the charged high-voltage terminal.
YES
OK?
YES
END
NO
Is the development high-voltage terminal contacting stably?
OK?
NO
Replace the development high-voltage terminal.
YES
OK?
YES
END
NO
Go to HIGH VOLTAGE SECTION.

CROSS REFERENCE:
HIGH VOLTAGE SECTION **()**

6.5.7.5. BLACK PRINT


Is a sheet of paper printed black in whole?
NO
YES
Is LSU normal?*1
OK?
NO
YES
Drum unit replace
Go to LSU Section.
OK?
YES
END
NO
Is the motion of the charged high-voltage terminal smooth?
OK?
NO
YES
Replace the charged high-voltage terminal.
OK?
YES
END
NO
Is the motion of the development high-voltage terminal smooth?
OK?
NO
YES
Replace the development high-voltage terminal.
OK?
YES
END
NO
Go to HIGH VOLTAGE SECTION.
Paper Travel

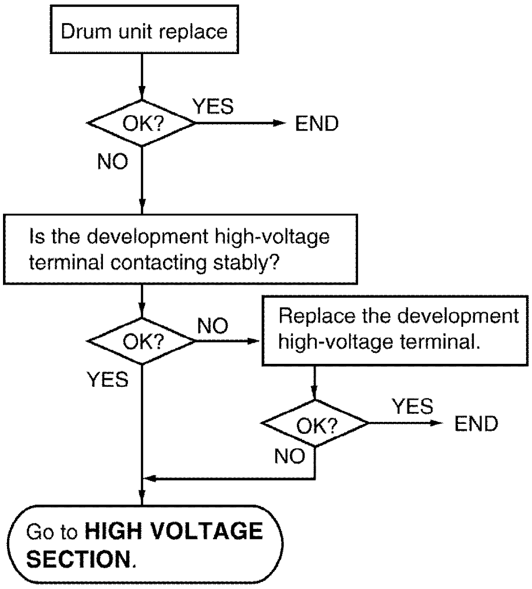
*1.Open the Cover.
Remove the Drum unit.
A black tape is pasted to the lens of LSU.
Check the output paper again.
If white paper is output, LSU is abnormal.

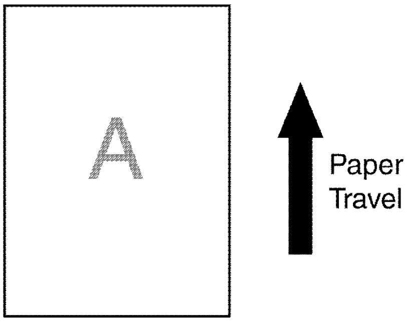
CROSS REFERENCE:

HIGH VOLTAGE SECTION ()

LSU SECTION ()

6.5.7.6. LIGHT PRINT

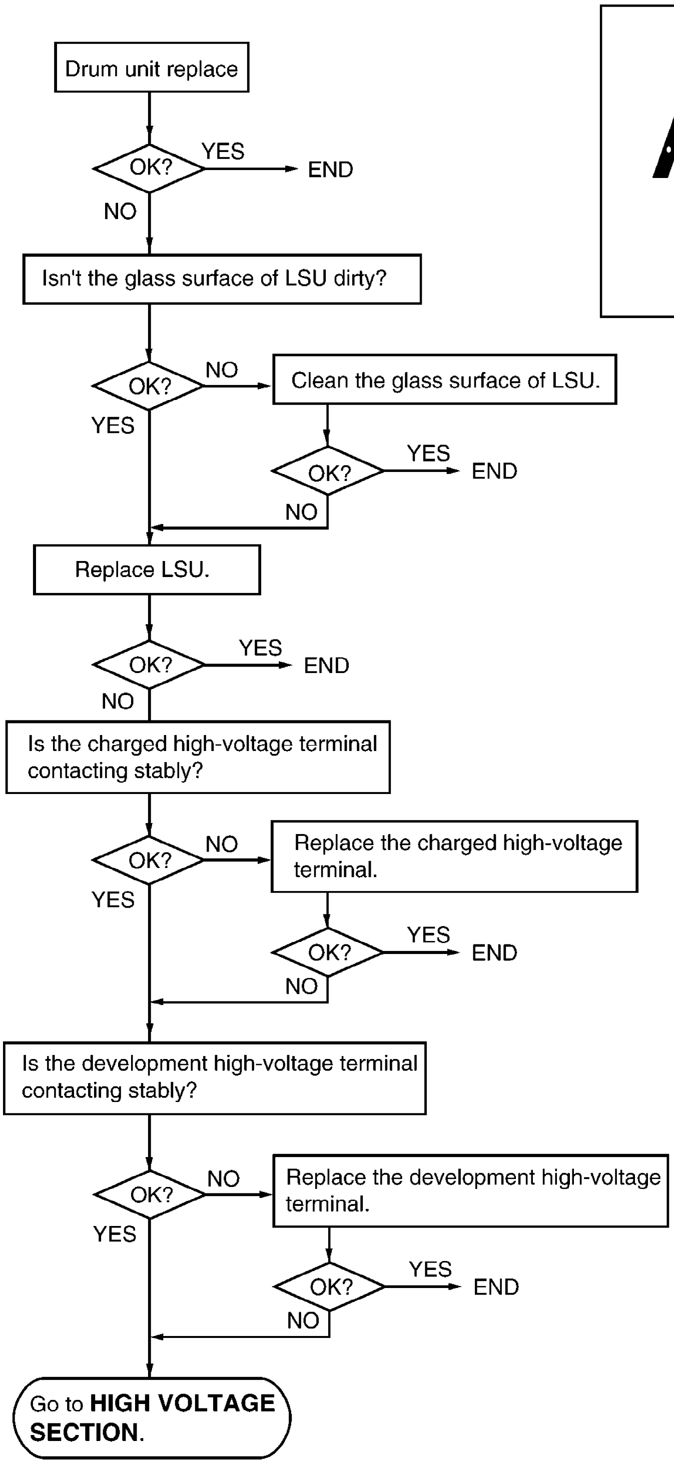

Drum unit replace
OK?
YES
END
NO
Is the development high-voltage terminal contacting stably?
OK?
NO
Replace the development high-voltage terminal.
YES
OK?
YES
END
NO
Go to HIGH VOLTAGE SECTION.

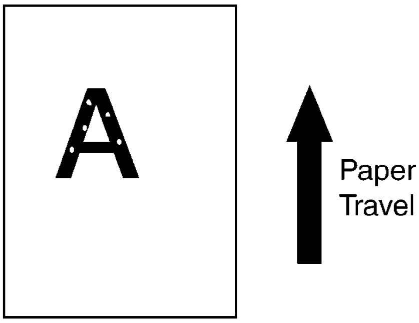

A
Paper
Travel

CROSS REFERENCE:

HIGH VOLTAGE SECTION ()

6.5.7.7. BLACK DENSITY IS LIGHT OR UNEVEN

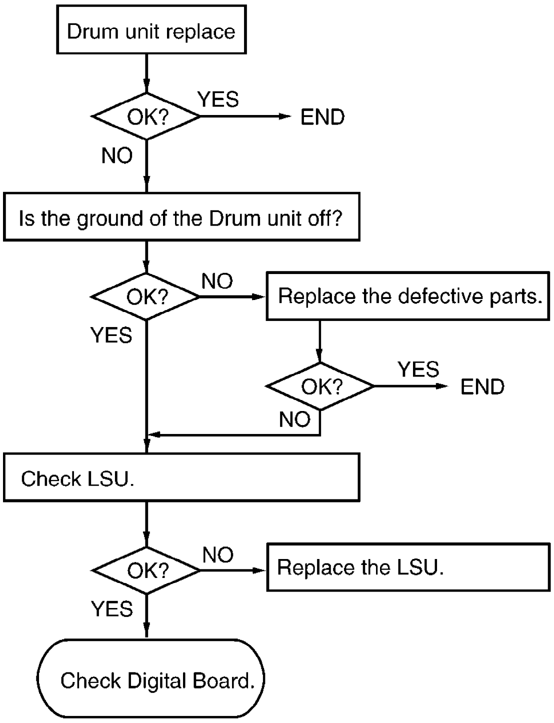

Drum unit replace
OK?
YES
END
NO
Isn't the glass surface of LSU dirty?
OK?
NO
Clean the glass surface of LSU.
OK?
YES
END
NO
YES
Replace LSU.
OK?
YES
END
NO
Is the charged high-voltage terminal contacting stably?
OK?
NO
Replace the charged high-voltage terminal.
OK?
YES
END
NO
YES
Is the development high-voltage terminal contacting stably?
OK?
NO
Replace the development high-voltage terminal.
OK?
YES
END
NO
YES
Go to HIGH VOLTAGE SECTION.

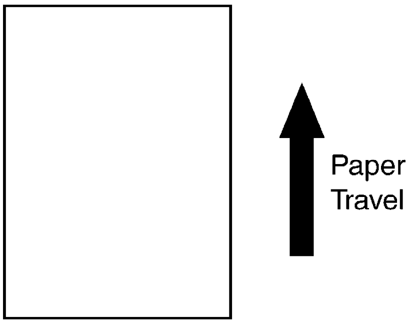

A
Paper Travel

CROSS REFERENCE:

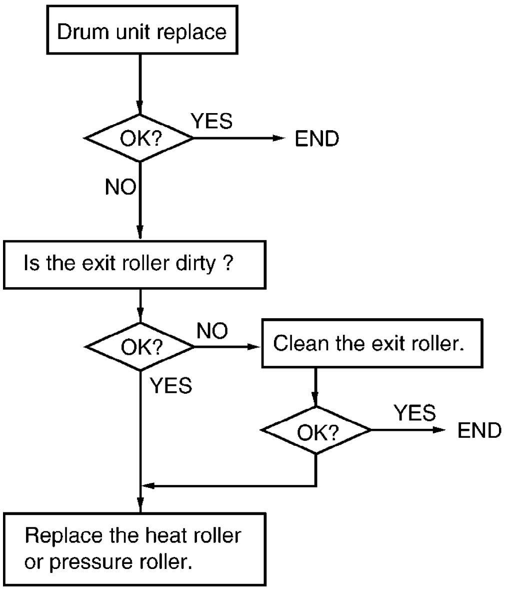
HIGH VOLTAGE SECTION ()

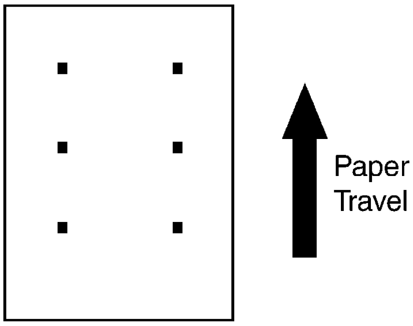
6.5.7.8. BLANK PRINT

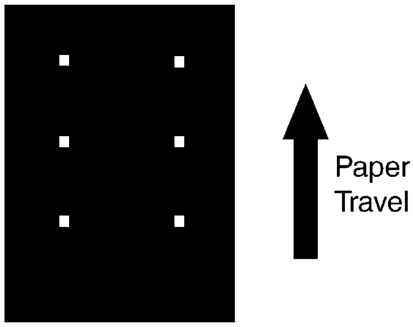

Drum unit replace
OK?
YES
END
NO
Is the ground of the Drum unit off?
OK?
NO
Replace the defective parts.
YES
OK?
YES
END
NO
Check LSU.
OK?
NO
Replace the LSU.
YES
Check Digital Board.


Paper
Travel

6.5.7.9. BLACK OR WHITE POINT

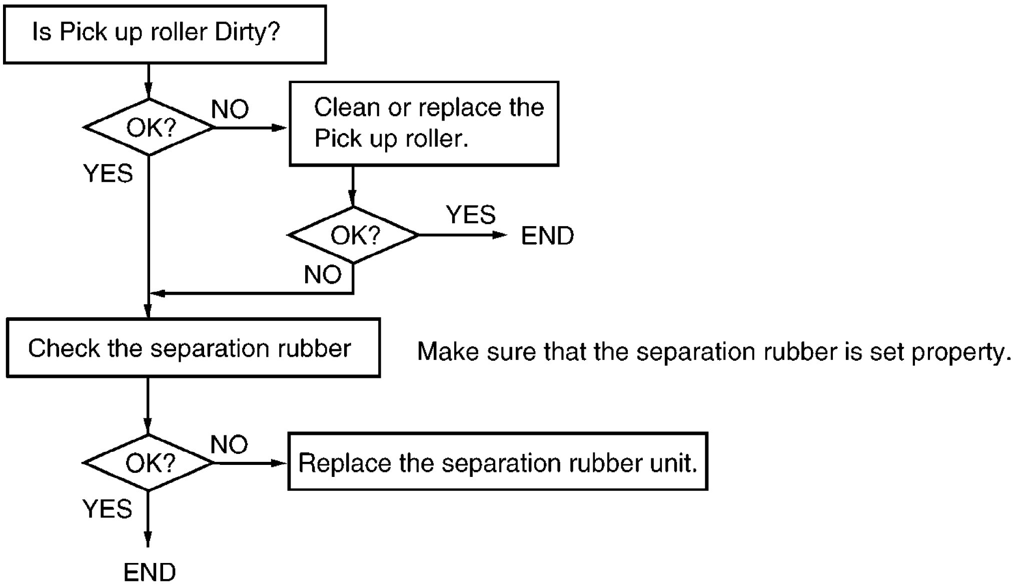

Drum unit replace
OK?
YES
END
NO
Is the exit roller dirty ?
OK?
NO
Clean the exit roller.
YES
OK?
YES
END
Replace the heat roller or pressure roller.


Paper
Travel

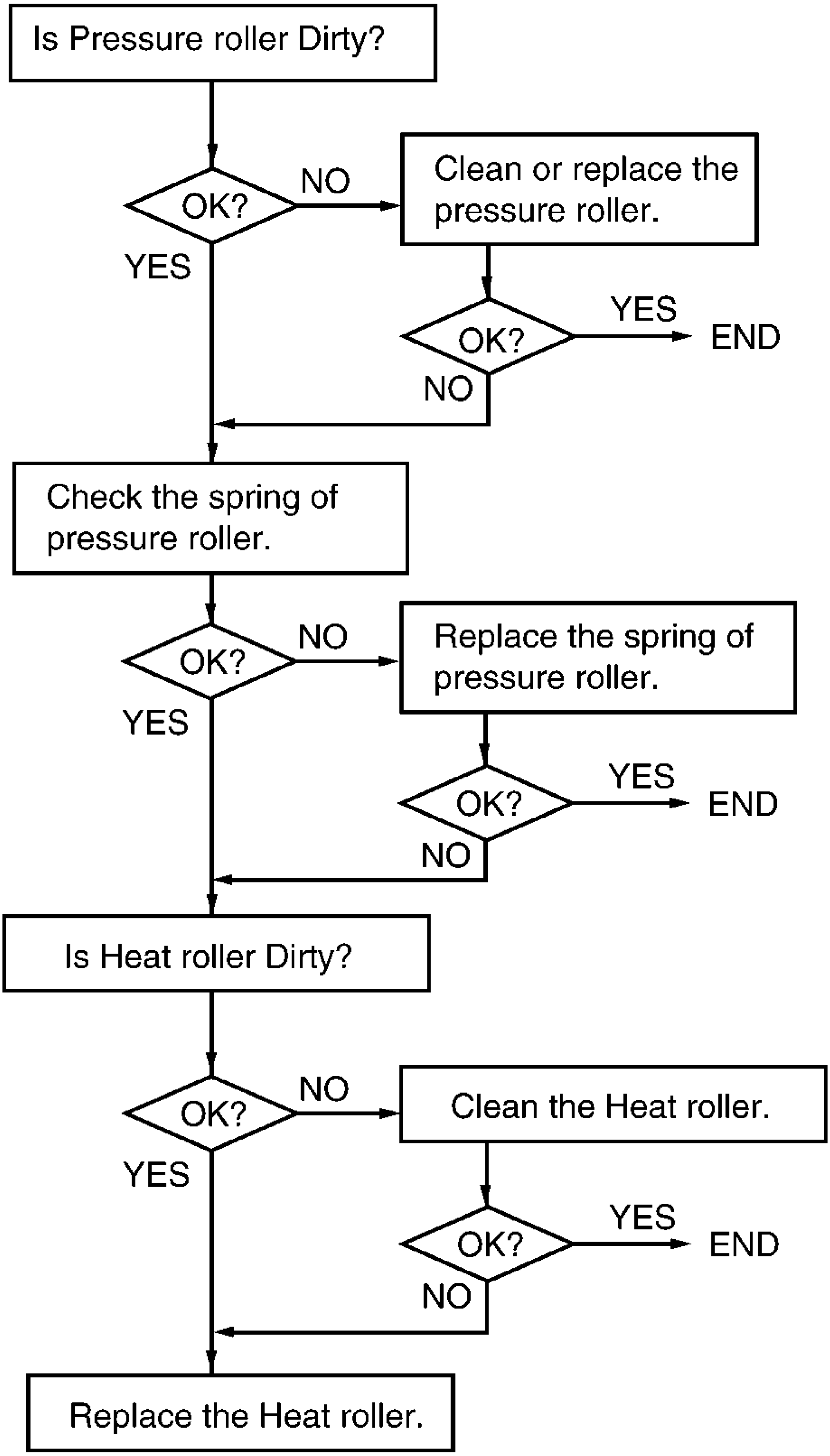

Paper
Travel

6.5.8. RECORDING PAPER FEED

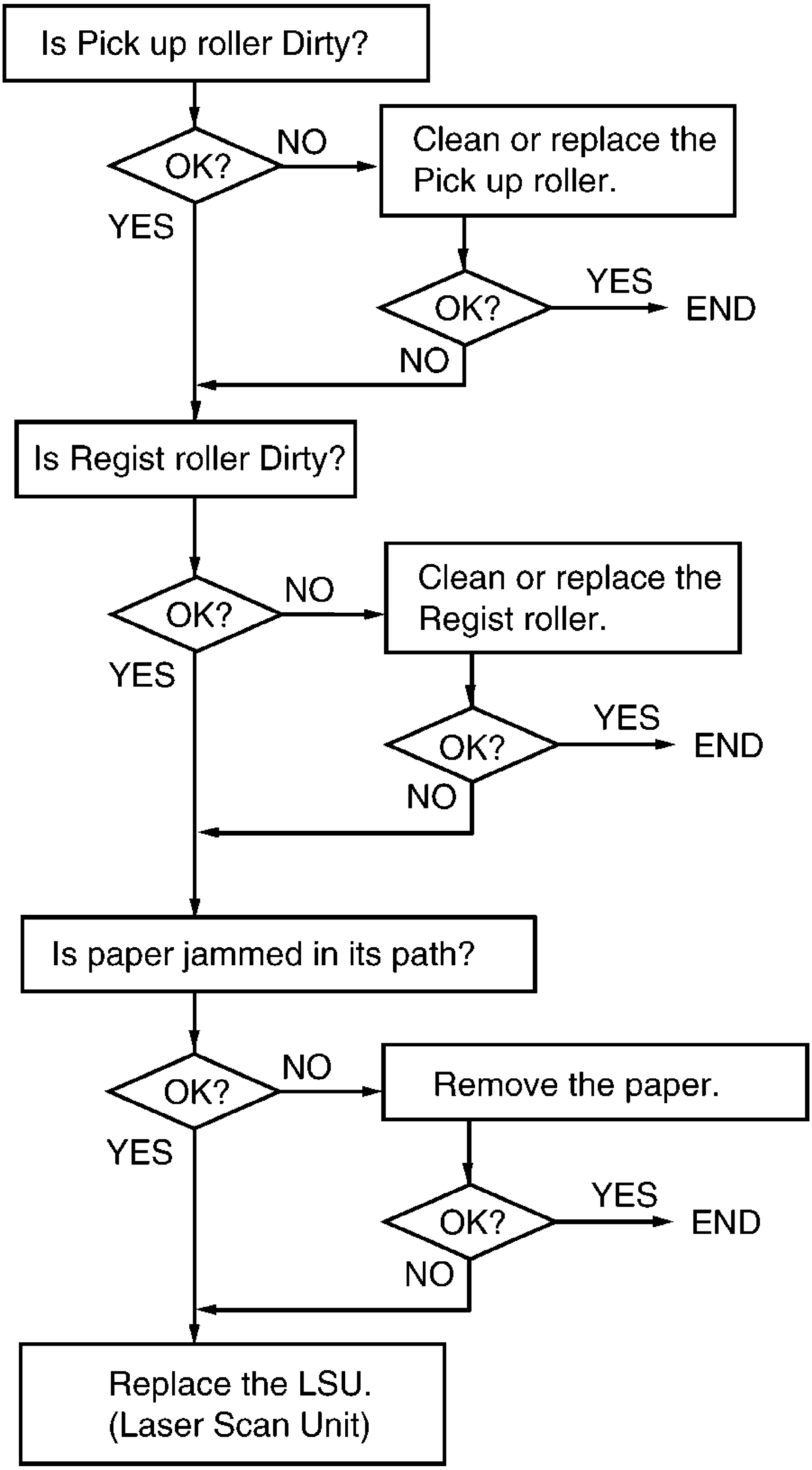
6.5.8.1. MULTIPLE FEED


Is Pick up roller Dirty?
OK?
NO
YES
Clean or replace the Pick up roller.
OK?
YES
END
NO
Check the separation rubber
Make sure that the separation rubber is set property.
OK?
NO
Replace the separation rubber unit.
YES
END

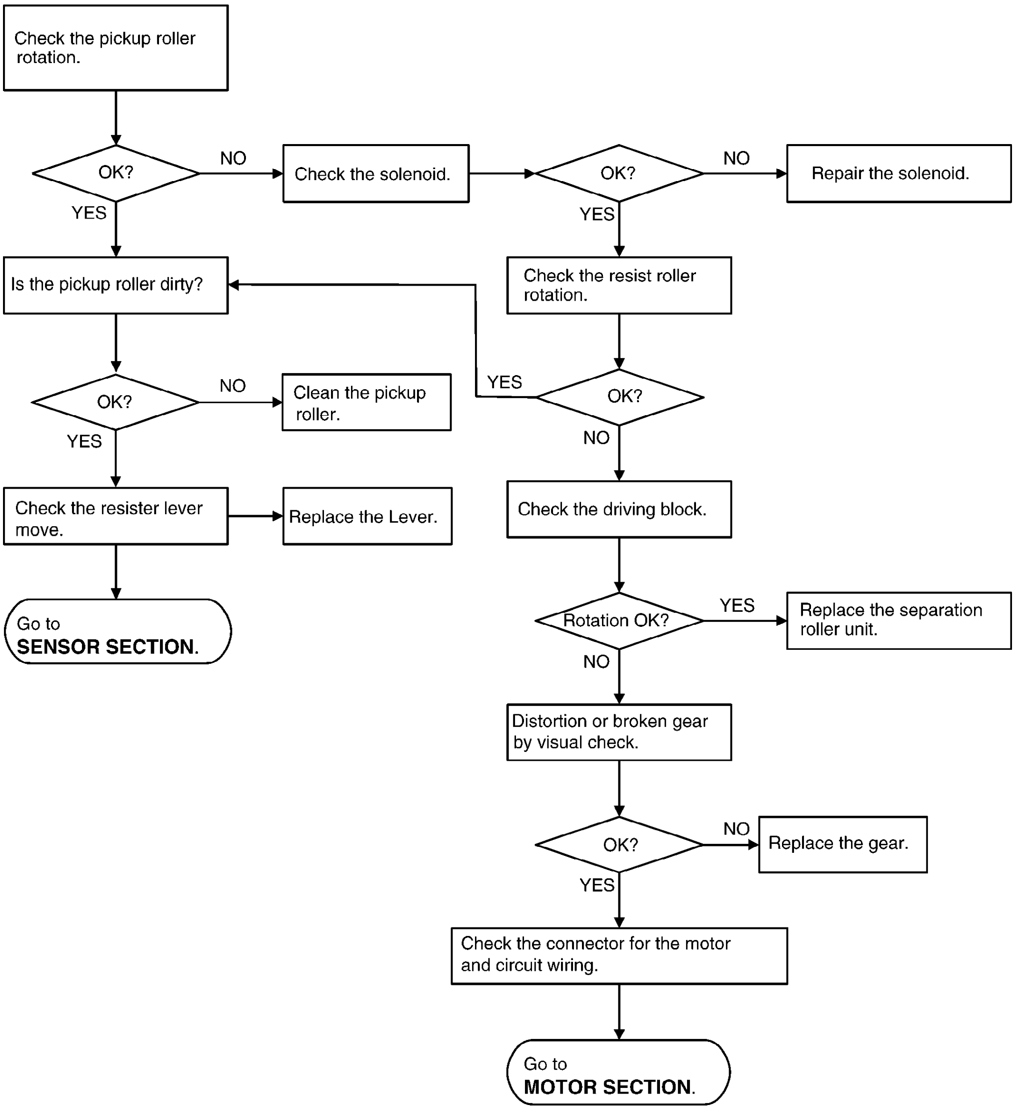
6.5.8.2. THE RECORDING PAPER IS WAVED OR WRINKLED


Is Pressure roller Dirty?
OK?
NO
Clean or replace the pressure roller.
YES
OK?
YES
END
NO
Check the spring of pressure roller.
OK?
NO
Replace the spring of pressure roller.
YES
OK?
YES
END
NO
Is Heat roller Dirty?
OK?
NO
Clean the Heat roller.
YES
OK?
YES
END
NO
Replace the Heat roller.

6.5.8.3. SKEW


Is Pick up roller Dirty?
OK?
NO
YES
Clean or replace the Pick up roller.
OK?
YES
END
NO
Is Regist roller Dirty?
OK?
NO
YES
Clean or replace the Regist roller.
OK?
YES
END
NO
Is paper jammed in its path?
OK?
NO
YES
Remove the paper.
OK?
YES
END
NO
Replace the LSU.
(Laser Scan Unit)

6.5.8.4. THE RECORDING PAPER DOES NOT FEED

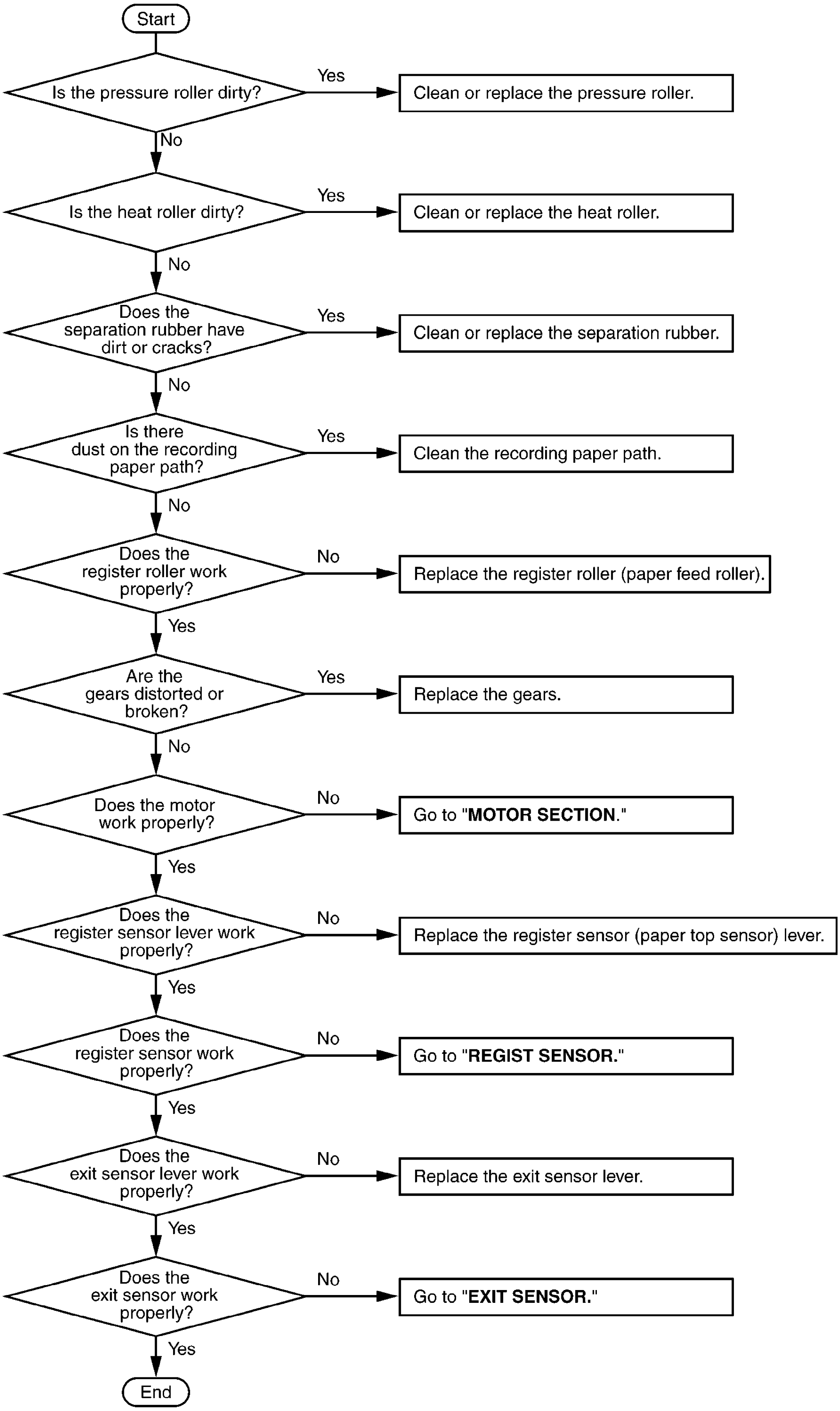

Check the pickup roller rotation.
OK?
NO
Check the solenoid.
OK?
NO
Repair the solenoid.
YES
YES
Is the pickup roller dirty?
Check the resist roller rotation.
OK?
NO
Clean the pickup roller.
YES
OK?
YES
NO
Check the resister lever move.
Replace the Lever.
Check the driving block.
Go to SENSOR SECTION.
Rotation OK?
YES
Replace the separation roller unit.
NO
Distortion or broken gear by visual check.
OK?
NO
Replace the gear.
YES
Check the connector for the motor and circuit wiring.
Go to MOTOR SECTION.

CROSS REFERENCE:

SENSOR SECTION ()

MOTOR SECTION ()

6.5.8.5. THE RECORDING PAPER JAM

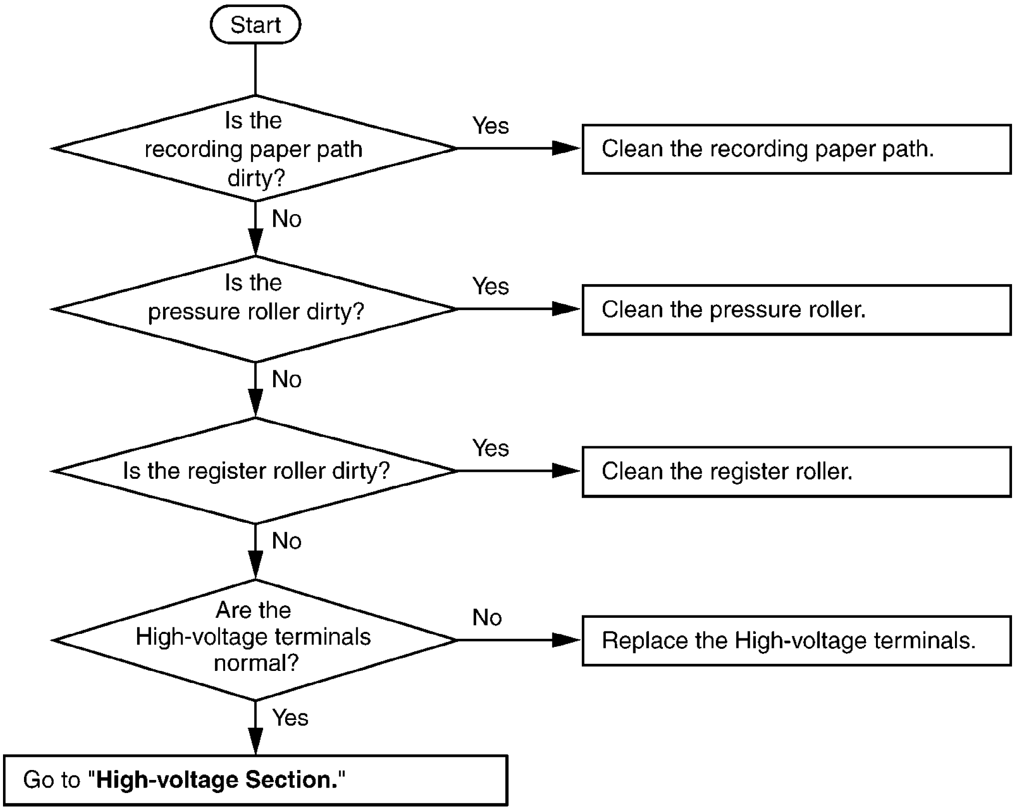

Start
Is the pressure roller dirty?
Yes
Clean or replace the pressure roller.
No
Is the heat roller dirty?
Yes
Clean or replace the heat roller.
No
Does the separation rubber have dirt or cracks?
Yes
Clean or replace the separation rubber.
No
Is there dust on the recording paper path?
Yes
Clean the recording paper path.
No
Does the register roller work properly?
No
Replace the register roller (paper feed roller).
Yes
Are the gears distorted or broken?
Yes
Replace the gears.
No
Does the motor work properly?
No
Go to "MOTOR SECTION."
Yes
Does the register sensor lever work properly?
No
Replace the register sensor (paper top sensor) lever.
Yes
Does the register sensor work properly?
No
Go to "REGIST SENSOR."
Yes
Does the exit sensor lever work properly?
No
Replace the exit sensor lever.
Yes
Does the exit sensor work properly?
No
Go to "EXIT SENSOR."
Yes
End

CROSS REFERENCE:

PAPER EXIT SENSOR..... “PAPER JAMMED” **()**
FAN MOTOR SECTION **()**
REGIST SENSOR **()**

When the recording paper jam is occurred, the service mode *630 distinguishes the cause.
0:No Paper Jam
1:Failed pick up
2:The paper top sensor is not turned OFF although the fixed time had passed since the sensor was turned ON.
3:The paper eject sensor is not turned ON although the fixed time had passed since the paper top sensor was turned ON.
4:The paper eject sensor is not turned OFF although the fixed time had passed since it was turned ON.
5:The register sensor (paper top sensor) or paper exit sensor was turned ON before the motor started to rotate.
6:The register sensor (paper top sensor) chattered.
7:The paper exit sensor chattered.

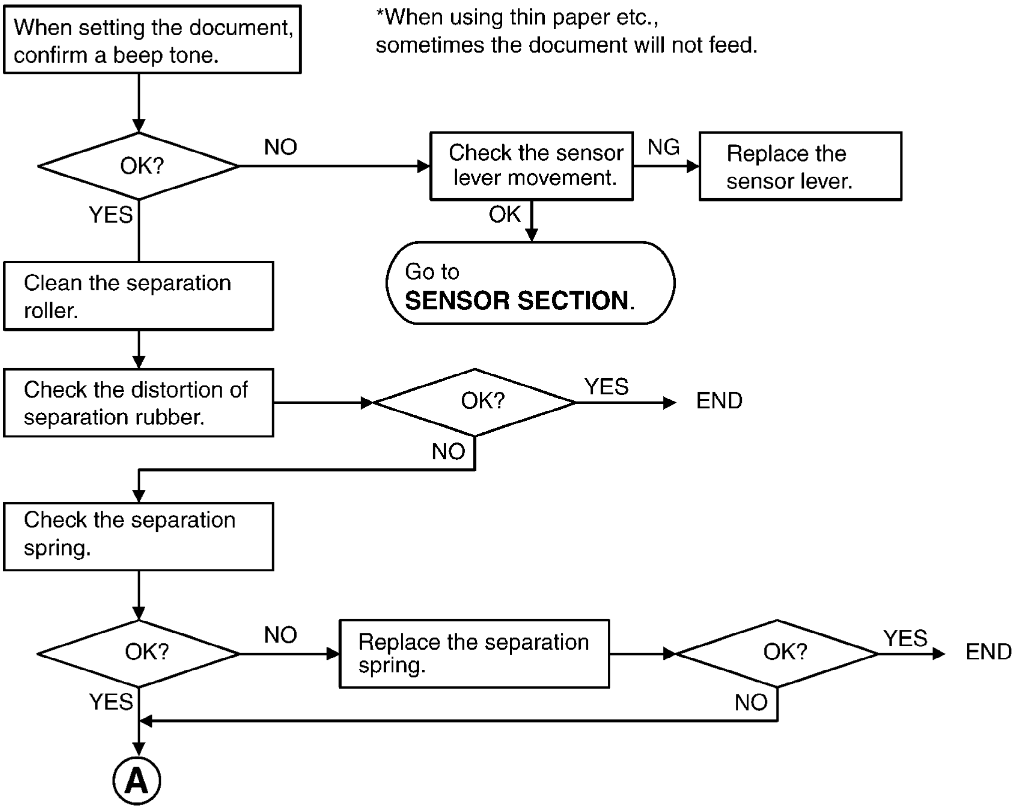
6.5.8.6. BACK SIDE OF THE RECORDING PAPER IS DIRTY


Start
Is the recording paper path dirty?
Yes
Clean the recording paper path.
No
Is the pressure roller dirty?
Yes
Clean the pressure roller.
No
Is the register roller dirty?
Yes
Clean the register roller.
No
Are the High-voltage terminals normal?
No
Replace the High-voltage terminals.
Yes
Go to "High-voltage Section."

CROSS REFERENCE:
HIGH VOLTAGE SECTION **()**

6.5.9. ADF (Auto document feed) SECTION

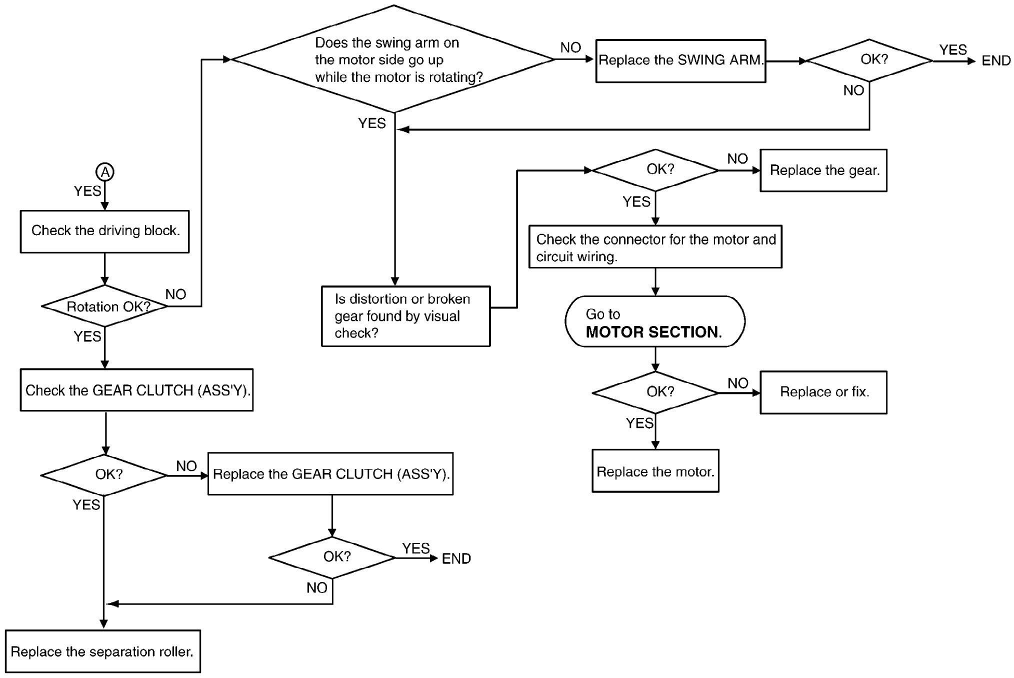
6.5.9.1. NO DOCUMENT FEED,DOCUMENT JAM and MULTIPLE DOCUMENT FEED.


When setting the document, confirm a beep tone.
OK?
NO
YES
Check the sensor lever movement.
NG
Replace the sensor lever.
OK
Go to SENSOR SECTION.
Clean the separation roller.
Check the distortion of separation rubber.
OK?
YES
END
NO
Check the separation spring.
OK?
NO
Replace the separation spring.
OK?
YES
END
NO
YES
A

*When using thin paper etc., sometimes the document will not feed.

CROSS REFERENCE:

SENSOR SECTION ()


Does the swing arm on the motor side go up while the motor is rotating?
NO
Replace the SWING ARM.
OK?
YES
END
NO
YES
A
YES
Check the driving block.
Rotation OK?
NO
YES
Check the GEAR CLUTCH (ASS'Y).
OK?
NO
Replace the GEAR CLUTCH (ASS'Y).
YES
OK?
YES
END
NO
Replace the separation roller.
Is distortion or broken gear found by visual check?
OK?
NO
Replace the gear.
YES
Check the connector for the motor and circuit wiring.
Go to MOTOR SECTION.
OK?
NO
Replace or fix.
YES
Replace the motor.

Depending on the circumstances, change the roller, one-way spring gear, etc., as well as the other rollers or parts.

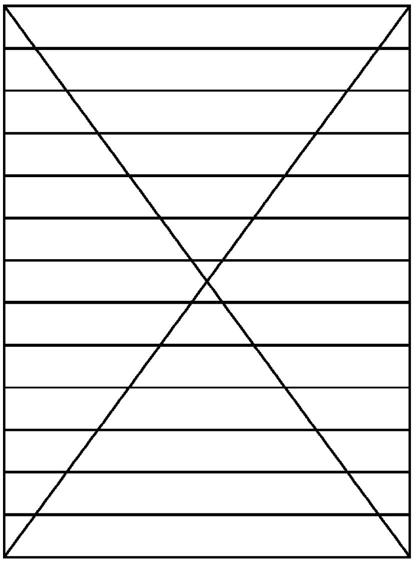
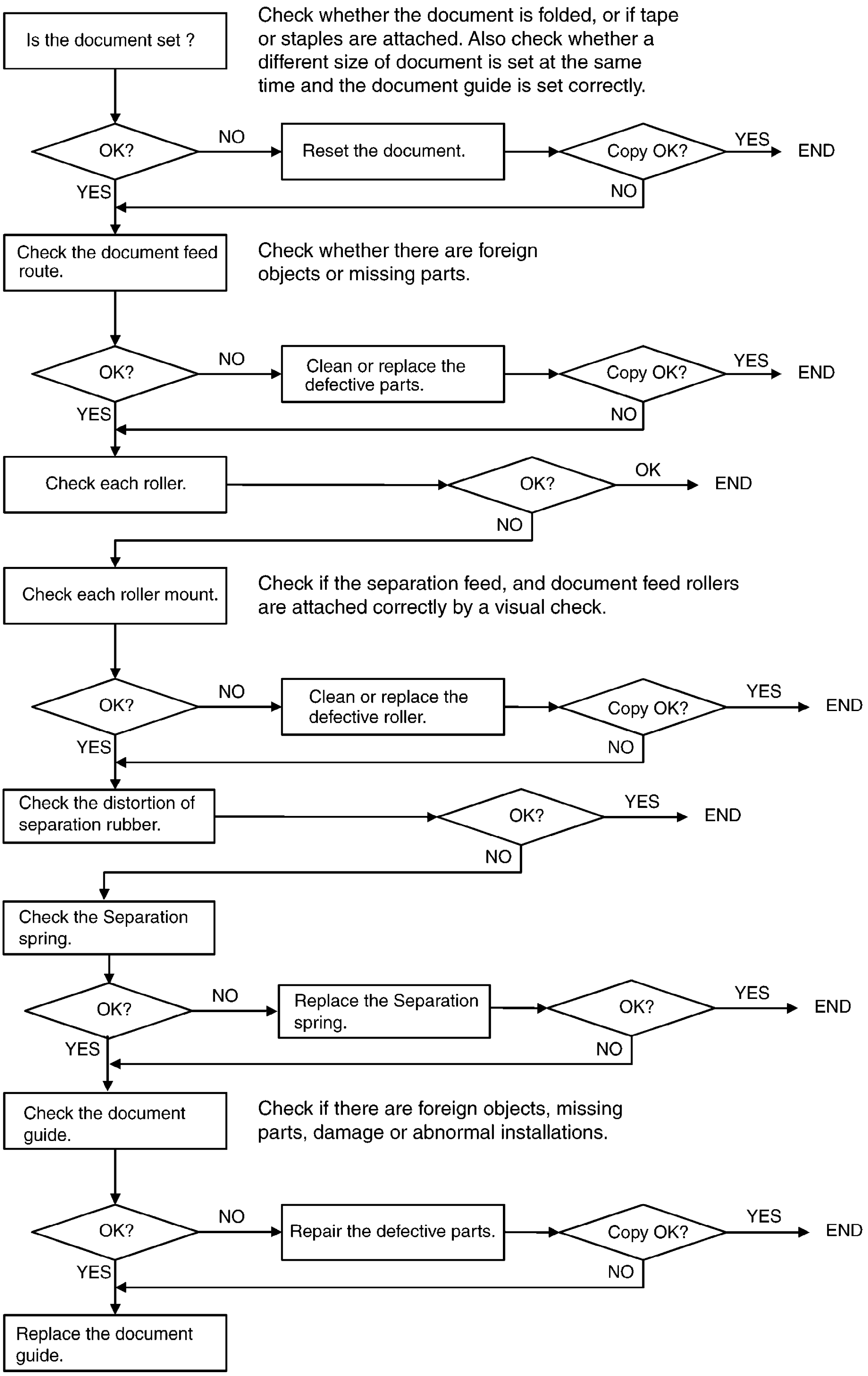


Fig. b

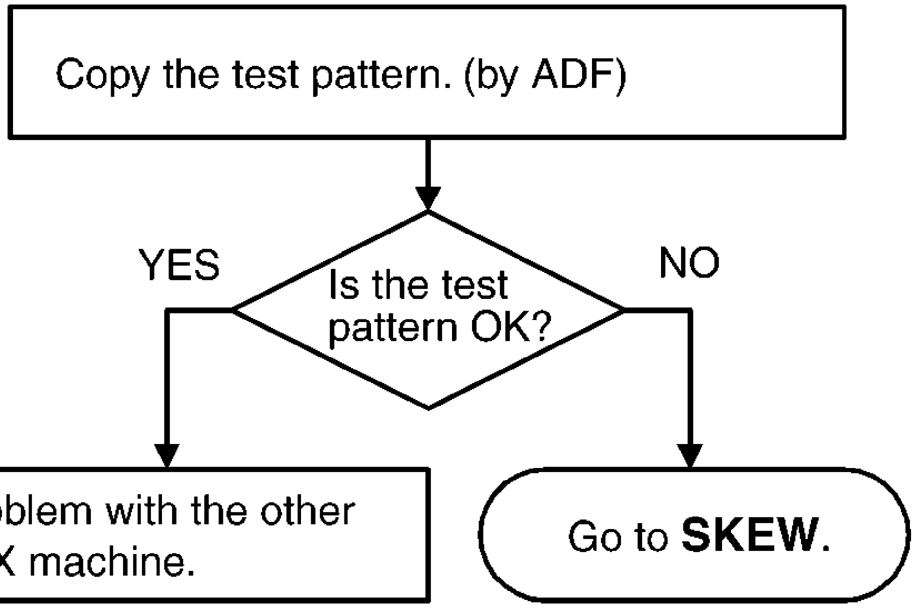
When confirming if the characters are extended or distorted on,if the feed problem occurs,use this test chart. (Fig b)

CROSS REFERENCE:
MOTOR SECTION ()

6.5.9.2. SKEW (ADF)

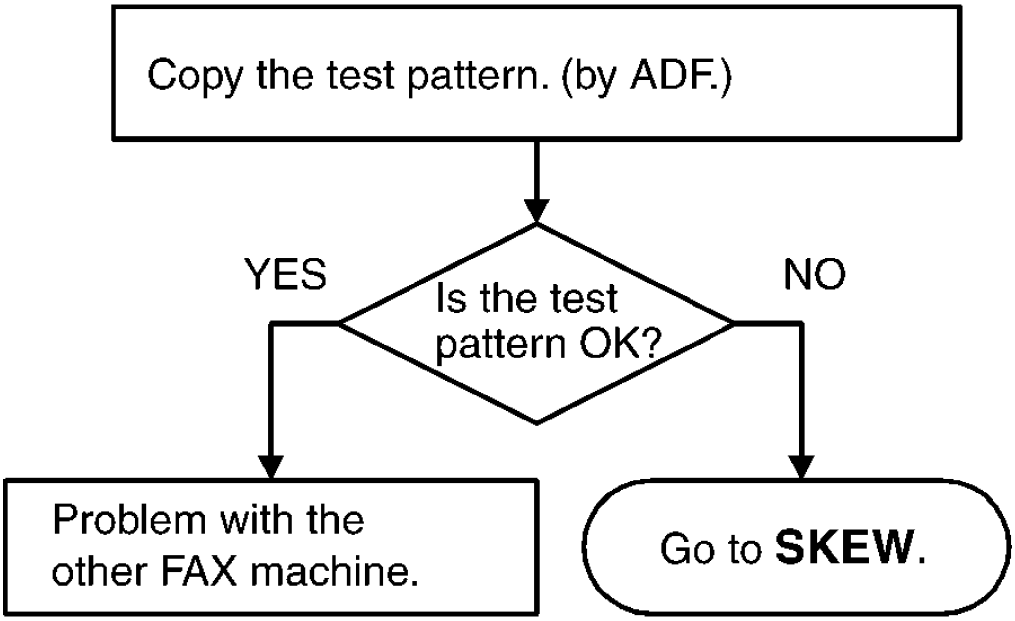

Is the document set ?
Check whether the document is folded, or if tape or staples are attached. Also check whether a different size of document is set at the same time and the document guide is set correctly.
OK?
NO
Reset the document.
Copy OK?
YES
END
NO
YES
Check the document feed route.
Check whether there are foreign objects or missing parts.
OK?
NO
Clean or replace the defective parts.
Copy OK?
YES
END
NO
YES
Check each roller.
OK?
OK
END
NO
Check each roller mount.
Check if the separation feed, and document feed rollers are attached correctly by a visual check.
OK?
NO
Clean or replace the defective roller.
Copy OK?
YES
END
NO
YES
Check the distortion of separation rubber.
OK?
YES
END
NO
Check the Separation spring.
OK?
NO
Replace the Separation spring.
OK?
YES
END
NO
YES
Check the document guide.
Check if there are foreign objects, missing parts, damage or abnormal installations.
OK?
NO
Repair the defective parts.
Copy OK?
YES
END
NO
YES
Replace the document guide.

6.5.9.3. THE SENT FAX DATA IS SKEWED


Copy the test pattern. (by ADF)
YES
Is the test pattern OK?
NO
Problem with the other FAX machine.
Go to **SKEW**.

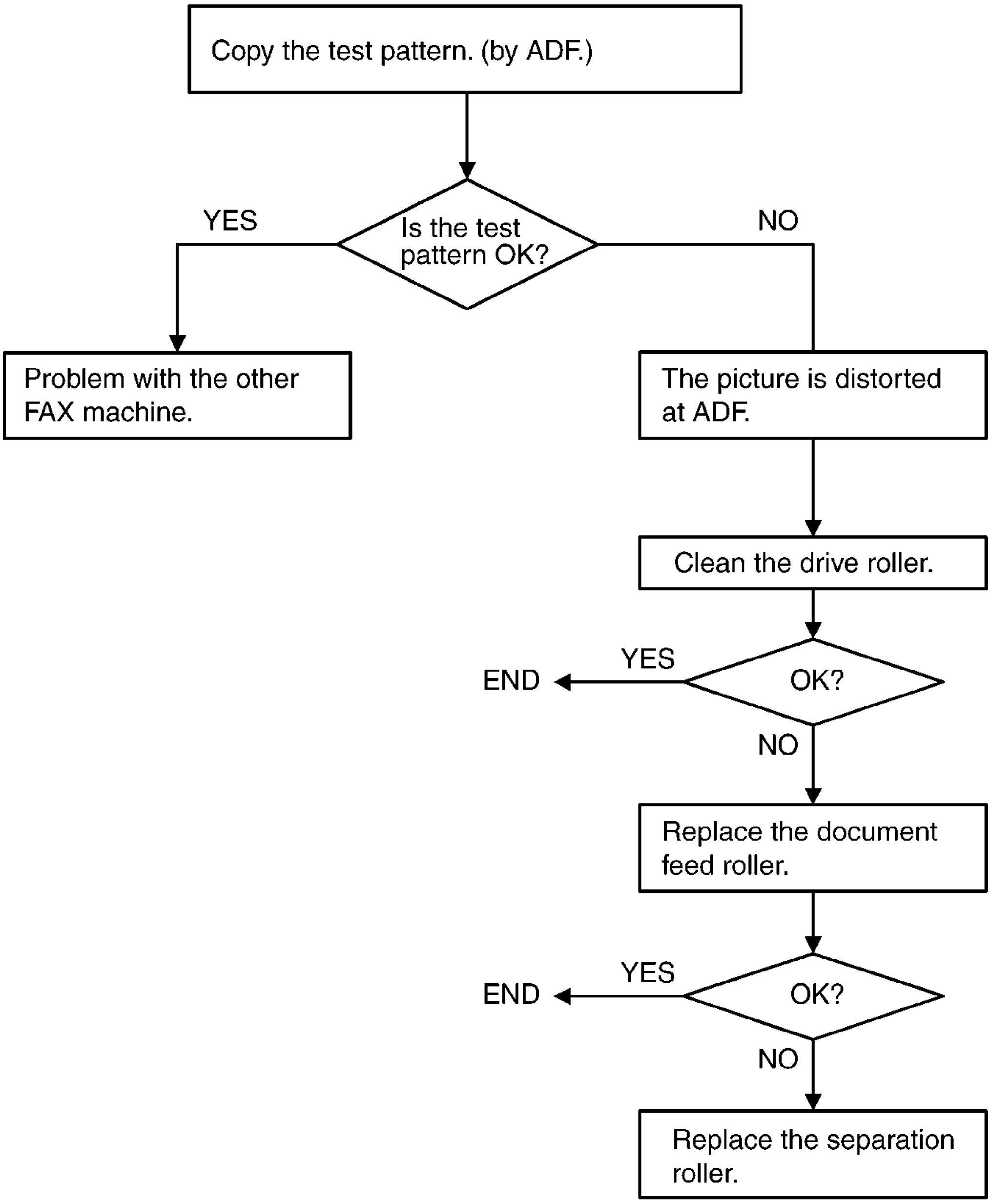
CROSS REFERENCE:
SKEW (ADF) ()

6.5.9.4. THE RECEIVED FAX DATA IS SKEWED

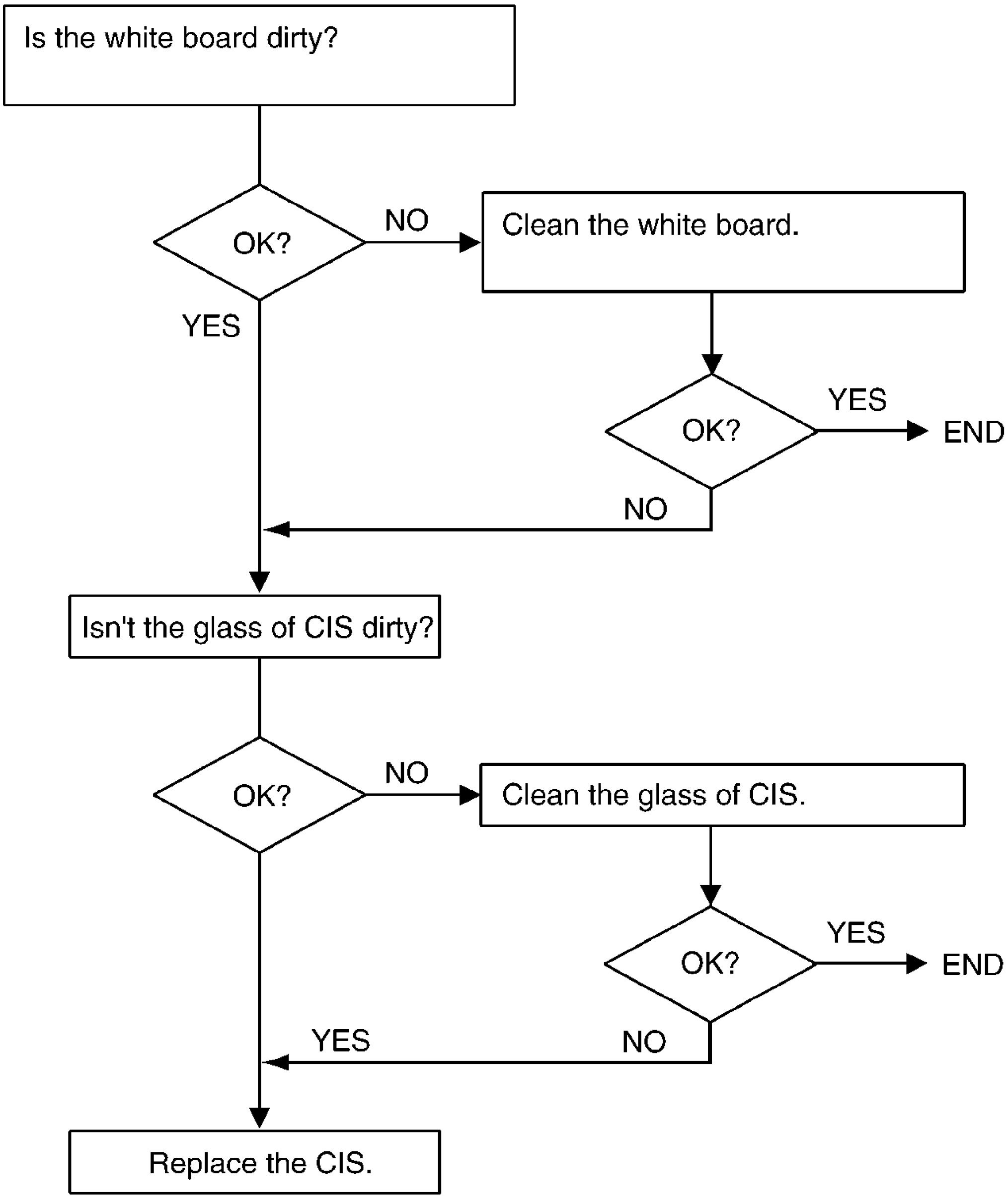

Copy the test pattern. (by ADF.)
YES
Is the test pattern OK?
NO
Problem with the other FAX machine.
Go to **SKEW**.

CROSS REFERENCE:
SKEW ()

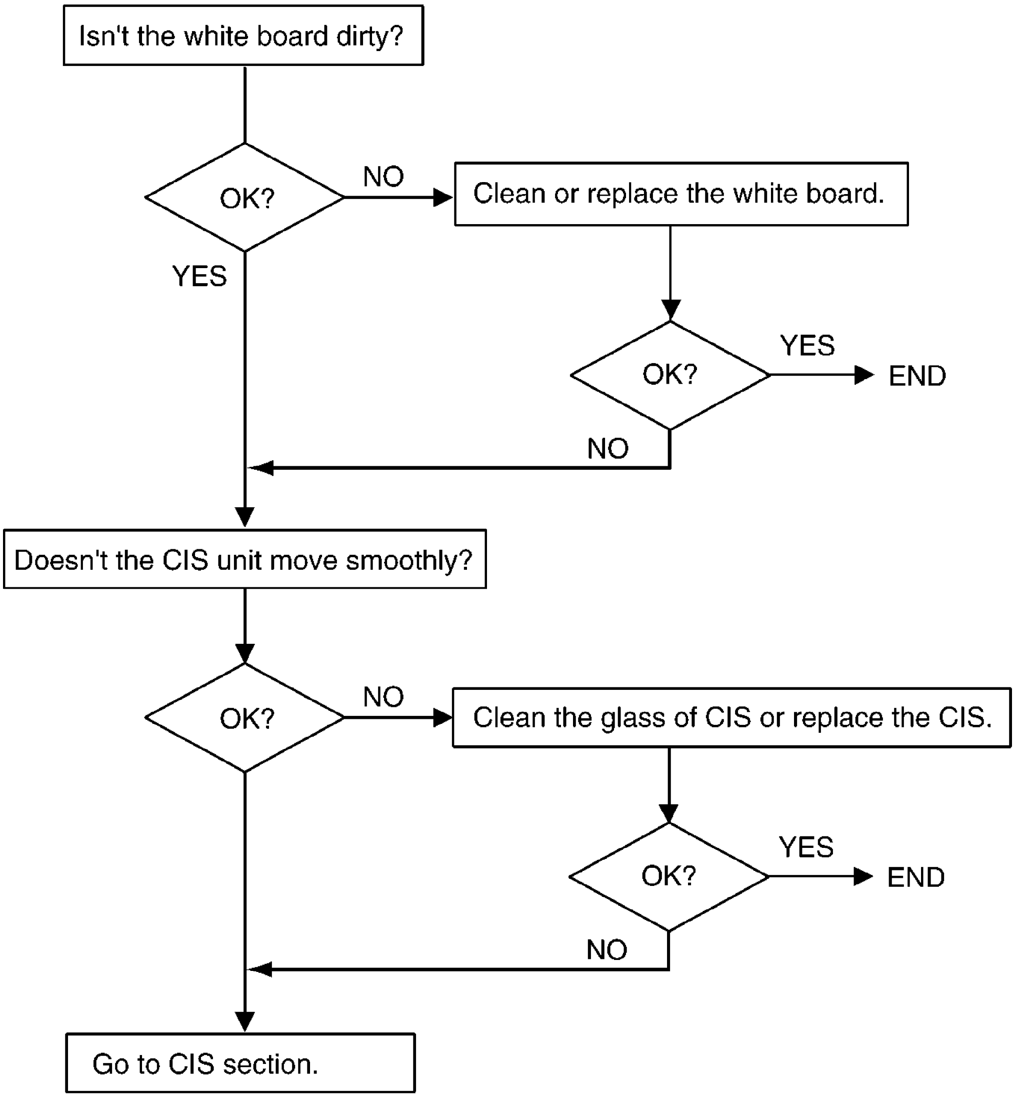
6.5.9.5. THE RECEIVED OR COPIED DATA IS EXPANDED


Copy the test pattern. (by ADF.)
YES
Is the test pattern OK?
NO
Problem with the other FAX machine.
The picture is distorted at ADF.
Clean the drive roller.
YES
END
OK?
NO
Replace the document feed roller.
YES
END
OK?
NO
Replace the separation roller.

6.5.9.6. BLACK OR WHITE VERTICAL LINE IS COPIED


Is the white board dirty?
OK?
NO
YES
Clean the white board.
OK?
YES
END
NO
Isn't the glass of CIS dirty?
OK?
NO
Clean the glass of CIS.
OK?
YES
END
YES
NO
Replace the CIS.

6.5.9.7. AN ABNORMAL IMAGE IS COPIED


Isn't the white board dirty?
OK?
NO
YES
Clean or replace the white board.
OK?
YES
END
NO
Doesn't the CIS unit move smoothly?
OK?
NO
Clean the glass of CIS or replace the CIS.
OK?
YES
END
NO
Go to CIS section.

CROSS REFERENCE:
CIS (Contact Image Sensor) SECTION ()

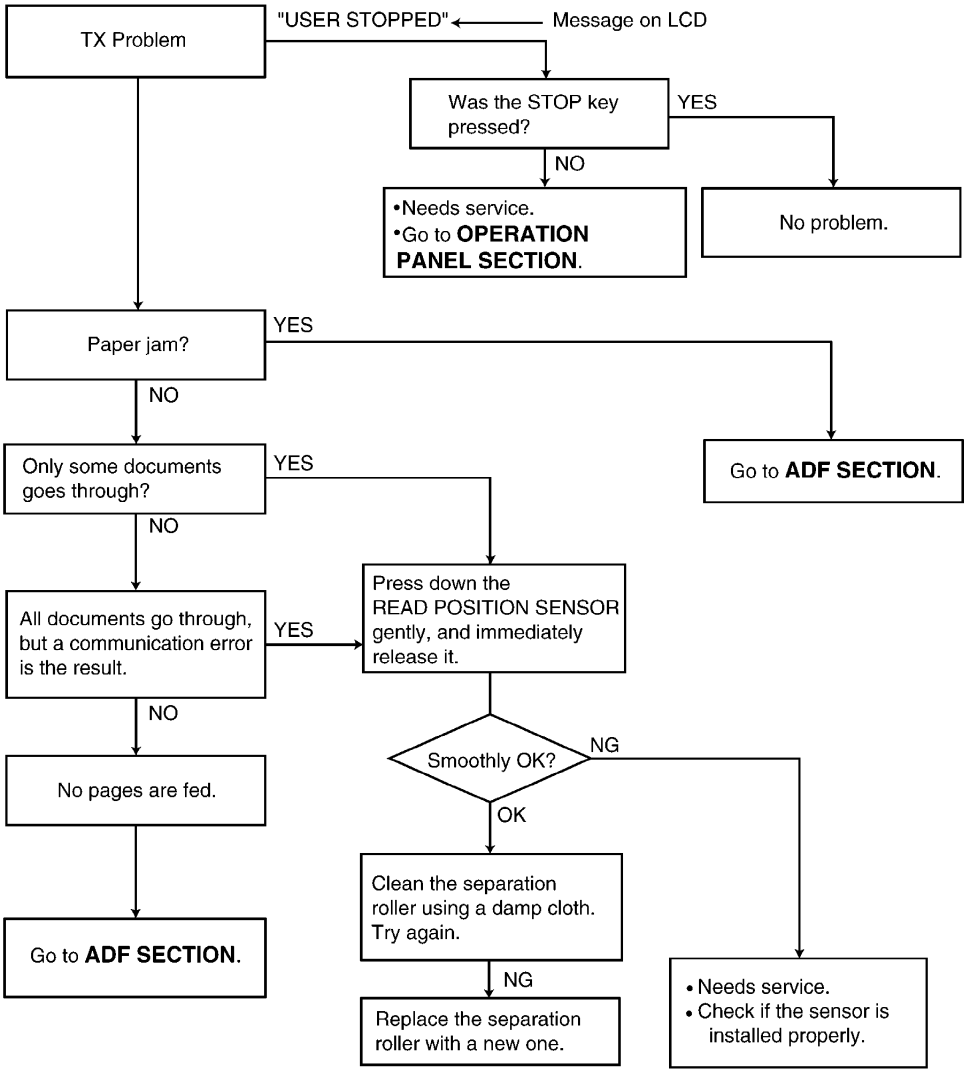
6.5.10. COMMUNICATION SECTION

Find the problem in the table shown below, and refer to the corresponding troubleshooting procedure in DEFECTIVE FACSIMILE SECTION ().

No.	Symptom	Content	Possible cause
1	The paper dose not feed properly when faxing. (Copying is also not possible.)	Troubleshooting	Problem with the feeding mechanism. (Refer to TRANSMIT PROBLEM ())
2	The fax transmits successfully one time and fails another. (Copying is also possible.)	Troubleshooting	Problem with the service line or with the receiver's fax. (Refer to SOMETIME THERE IS A TRANSMIT PROBLEM ())
3	The fax receives successfully one time and fails another. (Copying is also possible.)	Troubleshooting	Problem with the service line or with the transmitter's fax. (Refer to RECEIVE PROBLEM ())
4	The fax completely fails to transmit or receive. (Copying is also possible.)	Troubleshooting	Problem with the electric circuit. (Refer to THE UNIT CAN COPY, BUT CANNOT TRANSMIT/RECEIVE ())
5	The fax fails either to transmit or receive when making a long distance or an international call. (Copying is also possible.)	Detailed description of the possible causes (Similar to troubleshooting items No.2 and No.3.)	Problem with the service line.
6	The fax image is poor when transmitting or receiving during a long distance or international call.		
7	No.1-No.5	The troubleshooting procedure for each error code will be printed on the communication result report.	(Refer to HOW TO OUTPUT THE JOURNAL REPORT ())

6.5.10.1. DEFECTIVE FACSIMILE SECTION

6.5.10.1.1. TRANSMIT PROBLEM


TX Problem
"USER STOPPED"
Message on LCD
Was the STOP key pressed?
YES
NO
•Needs service.
•Go to **OPERATION PANEL SECTION**.
No problem.
Paper jam?
YES
NO
Go to **ADF SECTION**.
Only some documents goes through?
YES
NO
Press down the READ POSITION SENSOR gently, and immediately release it.
All documents go through, but a communication error is the result.
YES
NO
Smoothly OK?
NG
OK
No pages are fed.
Clean the separation roller using a damp cloth. Try again.
NG
Go to **ADF SECTION**.
Replace the separation roller with a new one.
• Needs service.
• Check if the sensor is installed properly.

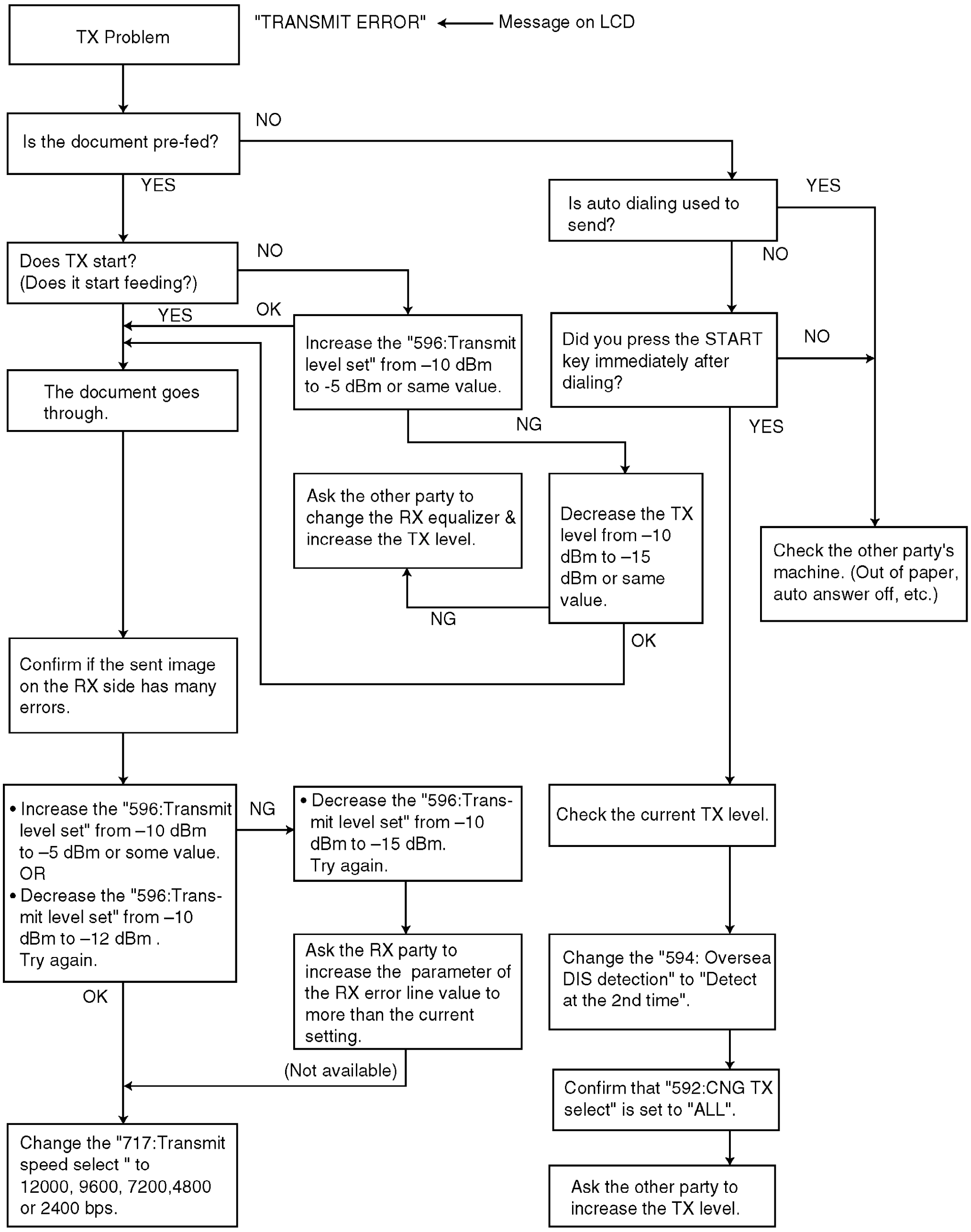
CROSS REFERENCE:

CLEANING THE INSIDE OF THE UNIT ()

ADF (Auto document feed) SECTION ()

OPERATION PANEL SECTION ()

6.5.10.1.2. SOMETIME THERE IS A TRANSMIT PROBLEM


TX Problem
"TRANSMIT ERROR"
Message on LCD
Is the document pre-fed?
NO
YES
Is auto dialing used to send?
YES
NO
Does TX start? (Does it start feeding?)
NO
YES
OK
Increase the "596:Transmit level set" from –10 dBm to -5 dBm or same value.
Did you press the START key immediately after dialing?
NO
YES
The document goes through.
NG
Ask the other party to change the RX equalizer & increase the TX level.
Decrease the TX level from –10 dBm to –15 dBm or same value.
Check the other party's machine. (Out of paper, auto answer off, etc.)
NG
OK
Confirm if the sent image on the RX side has many errors.
• Increase the "596:Transmit level set" from –10 dBm to –5 dBm or some value.
OR
• Decrease the "596:Transmit level set" from –10 dBm to –12 dBm .
Try again.
NG
• Decrease the "596:Transmit level set" from –10 dBm to –15 dBm.
Try again.
Check the current TX level.
OK
Ask the RX party to increase the parameter of the RX error line value to more than the current setting.
Change the "594: Oversea DIS detection" to "Detect at the 2nd time".
(Not available)
Confirm that "592:CNG TX select" is set to "ALL".
Change the "717:Transmit speed select " to 12000, 9600, 7200,4800 or 2400 bps.
Ask the other party to increase the TX level.

Note:

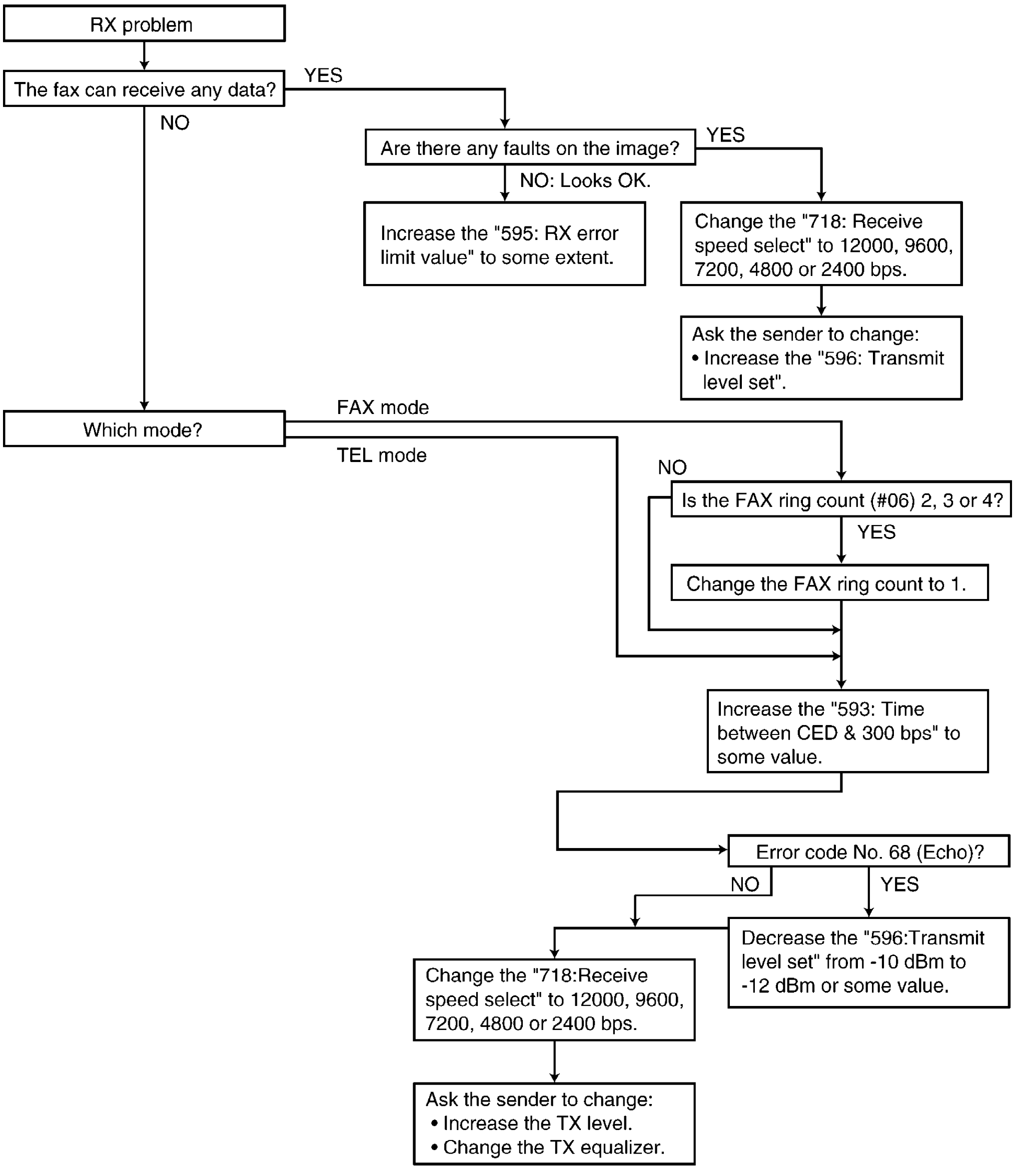
“596: Transmit level set” represents a service code. Refer to the SERVICE FUNCTION TABLE ().

“717: Transmit speed select” represents a service code. Refer to the SERVICE FUNCTION TABLE ().

6.5.10.1.3. RECEIVE PROBLEM

Confirm the following before starting troubleshooting.

- Is the recording paper installed properly? Refer to the next page.


RX problem
The fax can receive any data?
YES
NO
Are there any faults on the image?
YES
NO: Looks OK.
Increase the "595: RX error limit value" to some extent.
Change the "718: Receive speed select" to 12000, 9600, 7200, 4800 or 2400 bps.
Ask the sender to change:
• Increase the "596: Transmit level set".
Which mode?
FAX mode
TEL mode
NO
Is the FAX ring count (#06) 2, 3 or 4?
YES
Change the FAX ring count to 1.
Increase the "593: Time between CED & 300 bps" to some value.
Error code No. 68 (Echo)?
NO
YES
Decrease the "596:Transmit level set" from -10 dBm to -12 dBm or some value.
Change the "718:Receive speed select" to 12000, 9600, 7200, 4800 or 2400 bps.
Ask the sender to change:
• Increase the TX level.
• Change the TX equalizer.

Note:

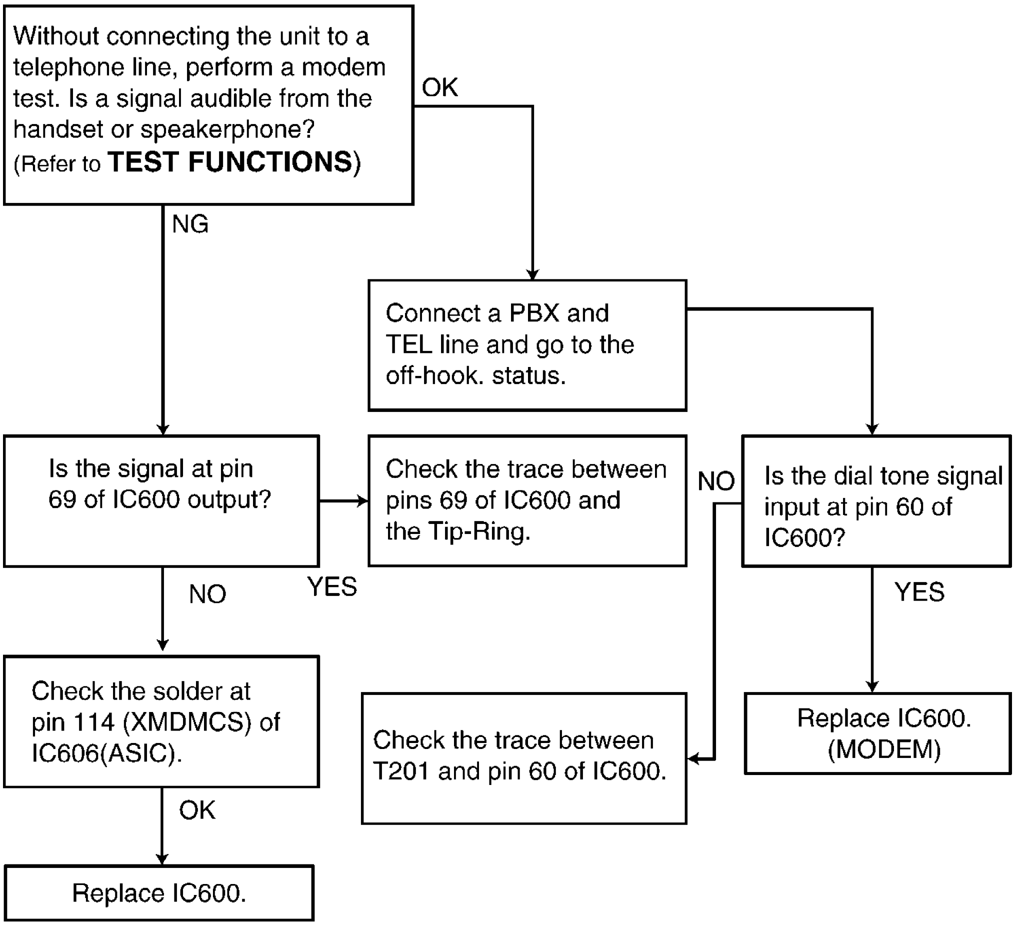
“596: Transmit level set” represents a service code. Refer to the SERVICE FUNCTION TABLE ().

“718: Receive speed select” represents a service code. Refer to the SERVICE FUNCTION TABLE ().

For the receiving problem, we have thought of causes other than in the software. Some causes may be when the fax changes to the memory receiving mode (for example, when out of paper). and the memory becomes full of the unprinted fax data. In this case, [MEMORY FULL] and its main cause (for example, “OUT OF PAPER”) are displayed on the LCD. Accordingly, by solving the main problem, [MEMORY FULL] can be canceled and the receiving problem can solved.

Please refer to USER RECOVERABLE ERRORS () for the above items.
Also, when it actually becomes a hardware deformity, please check each sensor.

6.5.10.1.4. THE UNIT CAN COPY, BUT CANNOT TRANSMIT/RECEIVE

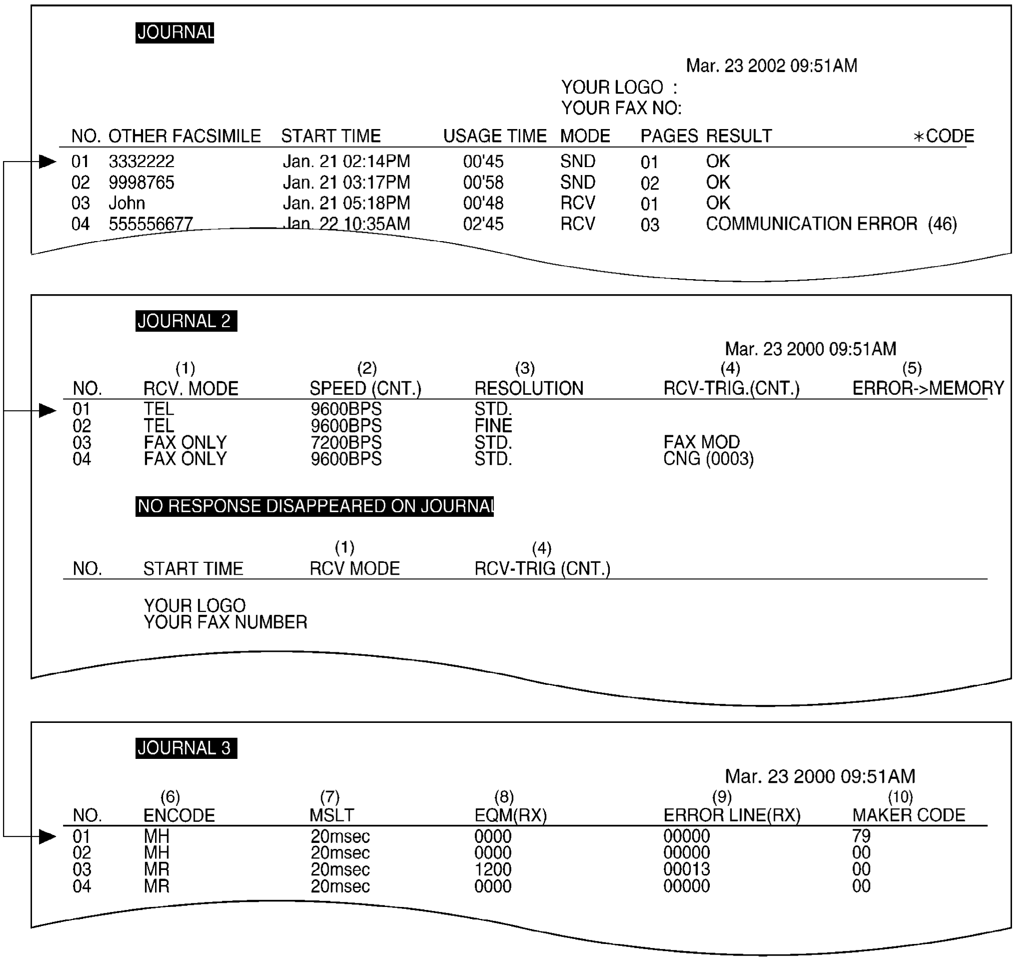

Without connecting the unit to a telephone line, perform a modem test. Is a signal audible from the handset or speakerphone?
(Refer to TEST FUNCTIONS)
OK
NG
Connect a PBX and TEL line and go to the off-hook. status.
Is the signal at pin 69 of IC600 output?
Check the trace between pins 69 of IC600 and the Tip-Ring.
NO
Is the dial tone signal input at pin 60 of IC600?
NO
YES
YES
Check the solder at pin 114 (XMDMCS) of IC606(ASIC).
Check the trace between T201 and pin 60 of IC600.
Replace IC600. (MODEM)
OK
Replace IC600.

CROSS REFERENCE:

TEST FUNCTIONS ()

6.5.11. SPECIAL SERVICE JOURNAL REPORTS

Journal 2 and Journal 3 shown below, which are special journals giving the additional detailed information about the latest 35 communications, can be printed by Service Code 881 or 882. Remote printing function for the journal reports (JOURNAL, JOURNAL 2 and JOURNAL 3) is also available for service technicians. (Refer to PROGRAM MODE TABLE().) The JOURNAL report only gives you basic information about a communication, but the other two journal reports provide different information on the same item (communication).



```
JOURNAL

                                                  Mar. 23 2002 09:51AM
                                          YOUR LOGO  :
                                          YOUR FAX NO:
NO. OTHER FACSIMILE  START TIME       USAGE TIME  MODE  PAGES  RESULT                       *CODE
01  3332222          Jan. 21 02:14PM  00'45       SND   01     OK
02  9998765          Jan. 21 03:17PM  00'58       SND   02     OK
03  John             Jan. 21 05:18PM  00'48       RCV   01     OK
04  555556677        Jan. 22 10:35AM  02'45       RCV   03     COMMUNICATION ERROR  (46)
```

```
JOURNAL 2

                                                            Mar. 23 2000 09:51AM
         (1)              (2)              (3)                  (4)                 (5)
NO.      RCV. MODE        SPEED (CNT.)     RESOLUTION           RCV-TRIG.(CNT.)     ERROR->MEMORY
01       TEL              9600BPS          STD.
02       TEL              9600BPS          FINE
03       FAX ONLY         7200BPS          STD.                 FAX MOD
04       FAX ONLY         9600BPS          STD.                 CNG (0003)

NO RESPONSE DISAPPEARED ON JOURNAL

                          (1)              (4)
NO.      START TIME       RCV MODE         RCV-TRIG (CNT.)

         YOUR LOGO
         YOUR FAX NUMBER
```

```
JOURNAL 3

                                                            Mar. 23 2000 09:51AM
         (6)              (7)              (8)                  (9)                 (10)
NO.      ENCODE           MSLT             EQM(RX)              ERROR LINE(RX)      MAKER CODE
01       MH               20msec           0000                 00000               79
02       MH               20msec           0000                 00000               00
03       MR               20msec           1200                 00013               00
04       MR               20msec           0000                 00000               00
```

HOW TO READ JOURNAL REPORTS:
Example:

1. **Look at NO. 01 in the JOURNAL. If you want to know about the details about that item, see NO. 01 in the JOURNAL 2 and the JOURNAL 3. You can get the following information.**
   *** MODE: Fax transmission**
   *** RCV. MODE: TEL**
   *** TX SPEED: 9.6 kbps**
   *** RESOLUTION: standard**
   *** ENCODE: MH**
   *** MAKER CODE: 79**
2. **Look at NO. 04 in the JOURNAL 2. CNG (0003) indicates that the CNG signal has been received three times since the purchase date.**

For further details, see JOURNAL 2 and JOURNAL 3.

6.5.11.1. JOURNAL 2

Refer to JOURNAL 2 in PRINTOUT EXAMPLE().
Journal 2 displays the additional detailed information about the last 35 communications.
Descriptions:
(1) RCV. MODE
Indicates which receive mode the unit was in when the unit received a fax message.
This information is also displayed when the unit transmitted a fax message.
(2) SPEED
Indicates the speed of the communication. If multiple pages are transmitted or received, it indicates the last page's communication speed. If there is a communication error, "?" is displayed.
(3) RESOLUTION
Indicates the resolution of the communication. If multiple pages are transmitted or received, it indicates the last page's resolution. If there is a communication error, "?" is displayed.
(4) RCV-TRIG. (CNT.)
Indicates the trigger that causes the unit to switch to the fax receive mode. The available options are listed in JOURNAL 2 in PRINTOUT EXAMPLE(). The values in parentheses indicate how many times the trigger has been used. (For example, "0003" means three times.)

No.	Display	Function
1	FAX MODE	Means the unit received a fax message in the FAX mode.
2	MAN RCV	Means the unit received a fax message by manual operation.
3	RMT DTMF	Means the unit detected DTMF (Remote Fax activation code) entered remotely.
4	PAL DTMF	Means the unit detected DTMF (Remote Fax activation code) entered by a parallel connected telephone.
5	TURN-ON	Means the unit started to receive after 10 rings. (Remote Turn On: Service Code #573)

(5) ERROR → MEMORY
Indicates the reason why the unit received a fax message in memory.
If you look at No.11 in the JOURNAL 2 in PRINTOUT EXAMPLE(), it shows the fax message was received in memory due to "PAPER OUT" error.
[NO RESPONSE DISAPPEARED ON JOURNAL]
The "NO RESPONSE DISAPPEARED ON JOURNAL" displays the information about the last 10 communications terminated by "No Response". (Some of the communications terminated by "No Response" were not displayed in the JOURNAL.)
When a fax transmission cannot be performed because the other party's unit is set to the TEL mode, "No response" will be printed.

6.5.11.2. JOURNAL 3

Refer to JOURNAL 3 in PRINTOUT EXAMPLE().

Description

(6) ENCODE
Compression Code: MH/MR/MMR

(7) MSLT
MSLT means Minimum Scan Line Time. Used only at the factory.

(8) EQM
EQM means Eye Quality Monitor. Used only at the factory.

(9) ERROR LINE (RX)
When an error occurs while receiving a fax, this shows the number of error lines.

(10) MAKER CODE
This shows a 2 digit code of the other party's fax machine brand.
0E: “KX” model
00: Unknown
79: “UF” model
19: “Xerox” model

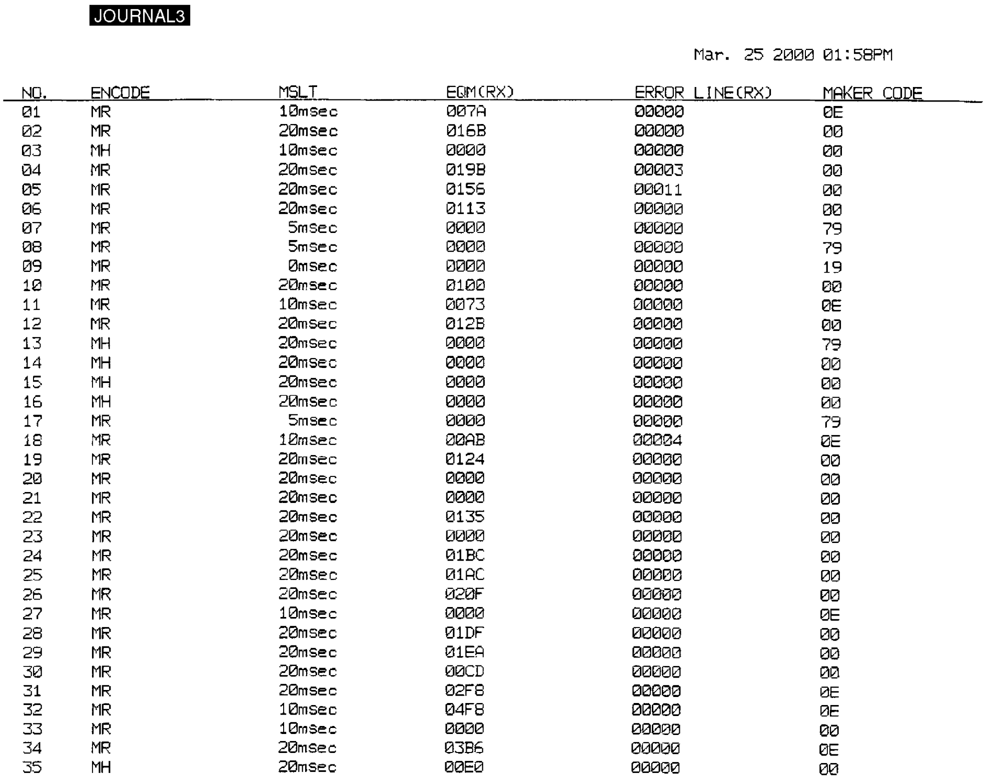
6.5.11.3. PRINTOUT EXAMPLE

JOURNAL2

```
                                                                        Mar. 25 2000 01:59PM

 NO.   RCV. MODE             SPEED   (CNT.)     RESOLUTION          RCV-TRIG.(CNT.)    ERROR->MEMORY
 01    FAX ONLY              9600BPS            FINE.               FAX MOD
 02    FAX ONLY              9600BPS            STD.                FAX MOD
 03    FAX ONLY              9600BPS            FINE.
 04    FAX ONLY              9600BPS            FINE.               FAX MOD
 05    FAX ONLY              9600BPS            FINE.               FAX MOD
 06    FAX ONLY              9600BPS            FINE.               FAX MOD
 07    FAX ONLY              9600BPS            FINE.
 08    FAX ONLY              9600BPS            FINE.
 09    FAX ONLY              9600BPS            FINE.
 10    FAX ONLY              9600BPS            STD.                FAX MOD
 11    FAX ONLY              9600BPS            FINE.               FAX MOD            PAPER OUT
 12    FAX ONLY              9600BPS            STD.                FAX MOD
 13    FAX ONLY              9600BPS            STD.
 14    FAX ONLY              ?                  ?
 15    FAX ONLY              ?                  ?
 16    FAX ONLY              ?                  ?
 17    FAX ONLY              9600BPS            STD.
 18    FAX ONLY              9600BPS            FINE.               FAX MOD
 19    FAX ONLY              9600BPS            STD.                FAX MOD
 20    FAX ONLY              9600BPS            S-FINE.
 21    FAX ONLY              9600BPS            FINE.
 22    FAX ONLY              9600BPS            FINE.               FAX MOD
 23    FAX ONLY              ?                  ?                   FAX MOD
 24    FAX ONLY              9600BPS            STD.                FAX MOD
 25    FAX ONLY              9600BPS            STD.                FAX MOD
 26    FAX ONLY              9600BPS            FINE.               FAX MOD
 27    FAX ONLY              9600BPS            FINE.
 28    FAX ONLY              9600BPS            STD.                FAX MOD
 29    FAX ONLY              9600BPS            FINE.               FAX MOD
 30    FAX ONLY              9600BPS            S-FINE.             FAX MOD
 31    FAX ONLY              9600BPS            STD.                FAX MOD
 32    FAX ONLY              9600BPS            STD.                FAX MOD
 33    FAX ONLY              ?                  ?                   FAX MOD
 34    FAX ONLY              9600BPS            STD.                FAX MOD
 35    FAX ONLY              9600BPS            STD.                FAX MOD
```

NO RESPONSE DISAPPEARED ON JOURNAL

```
 NO.   START TIME            RCV MODE           RCV-TRIG.(CNT.)
```



JOURNAL3

Mar. 25 2000 01:58PM

NO.	ENCODE	MSLT	EQM(RX)	ERROR LINE(RX)	MAKER CODE
01	MR	10msec	007A	00000	0E
02	MR	20msec	016B	00000	00
03	MH	10msec	0000	00000	00
04	MR	20msec	019B	00003	00
05	MR	20msec	0156	00011	00
06	MR	20msec	0113	00000	00
07	MR	5msec	0000	00000	79
08	MR	5msec	0000	00000	79
09	MR	0msec	0000	00000	19
10	MR	20msec	0100	00000	00
11	MR	10msec	0073	00000	0E
12	MR	20msec	012B	00000	00
13	MH	20msec	0000	00000	79
14	MH	20msec	0000	00000	00
15	MH	20msec	0000	00000	00
16	MH	20msec	0000	00000	00
17	MR	5msec	0000	00000	79
18	MR	10msec	00AB	00004	0E
19	MR	20msec	0124	00000	00
20	MR	20msec	0000	00000	00
21	MR	20msec	0000	00000	00
22	MR	20msec	0135	00000	00
23	MR	20msec	0000	00000	00
24	MR	20msec	01BC	00000	00
25	MR	20msec	01AC	00000	00
26	MR	20msec	020F	00000	00
27	MR	10msec	0000	00000	0E
28	MR	20msec	01DF	00000	00
29	MR	20msec	01EA	00000	00
30	MR	20msec	00CD	00000	00
31	MR	20msec	02F8	00000	0E
32	MR	10msec	04F8	00000	0E
33	MR	10msec	0000	00000	00
34	MR	20msec	03B6	00000	0E
35	MH	20msec	00E0	00000	00

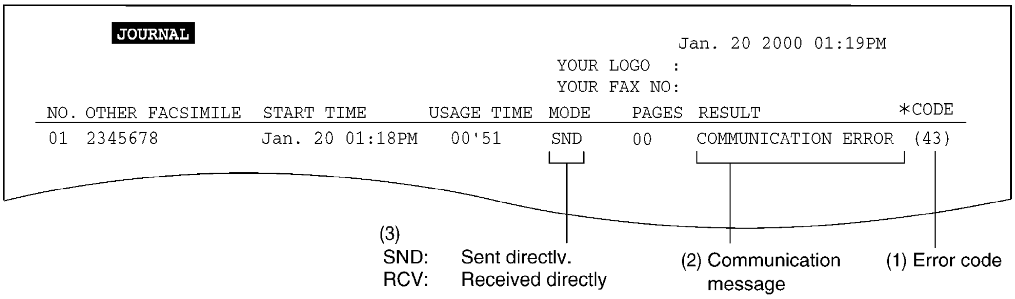
6.5.11.4. HOW TO OUTPUT THE JOURNAL REPORT

1. Press the MENU button.

2. Press “#”, then “8” and “3”.

3. Press the START/COPY/SET button.

4. The report prints out.



JOURNAL

Jan. 20 2000 01:19PM
YOUR LOGO :
YOUR FAX NO:

NO.	OTHER FACSIMILE	START TIME	USAGE TIME	MODE	PAGES	RESULT	*CODE
01	2345678	Jan. 20 01:18PM	00'51	SND	00	COMMUNICATION ERROR	(43)

CROSS REFERENCE:

FEATURES()

Error code table:

(1) CODE	(2) RESULT	(3) MODE	SYMPTOM	Co me
	PRESSED THE STOP KEY	SND & RCV	Communication was interrupted by the STOP button.	
	DOCUMENT JAMMED	SND	The document paper is jammed.	
	NO DOCUMENT	SND	No document paper.	
	THE COVER WAS OPENED	SND	The cover is open.	
28	COMMUNICATION ERROR	SND & RCV	---------	
40	COMMUNICATION ERROR	SND	Transmission is finished when the T1 TIMER expires.	
41	COMMUNICATION ERROR	SND	DCN is received after DCS transmission.	
42	COMMUNICATION ERROR	SND	FTT is received after transmission of a 2400BSP training signal.	
43	COMMUNICATION ERROR	SND	No response after post message is transmitted three times.	
44	COMMUNICATION ERROR	SND	RTN and PIN are received.	
46	COMMUNICATION ERROR	RCV	No response after FTT is transmitted.	
48	COMMUNICATION ERROR	RCV	No post message.	
49	COMMUNICATION ERROR	RCV	RTN is transmitted.	
50	COMMUNICATION ERROR	RCV	PIN is transmitted (to PRI-Q).	
51	COMMUNICATION ERROR	RCV	PIN is transmitted.	
52	COMMUNICATION ERROR	RCV	Reception is finished when the T1 TIMER expires.	
54	ERROR-NOT YOUR UNIT	RCV	DCN is received after DIS transmission.	
58	COMMUNICATION ERROR	RCV	DCN is received after FTT transmission.	
59	ERROR-NOT YOUR UNIT	SND	DCN responds to the post message.	
65	COMMUNICATION ERROR	SND	DCN is received before DIS reception.	
65	COMMUNICATION ERROR	RCV	Reception is not EOP, EOM PIP, PIN, RTP or RTN.	
68	COMMUNICATION ERROR	RCV	No response at the other party after MCF or CFR is transmitted.	
70	ERROR-NOT YOUR UNIT	RCV	DCN is received after CFR transmission.	

(1) CODE	(2) RESULT	(3) MODE	SYMPTOM	Co me
72	COMMUNICATION ERROR	RCV	Carrier is cut when the image signal is received.	
75	MEMORY FULL	RCV	The document was not received due to memory full.	
79	CANCELED	SND	The multi-station transmission was rejected by the user.	
FF	COMMUNICATION ERROR	SND & RCV	Modem error. For the DCN, DCN, etc. abbreviations, refer to MODEM SECTION ().	

SND=TRANSMISSION / RCV=RECEPTION

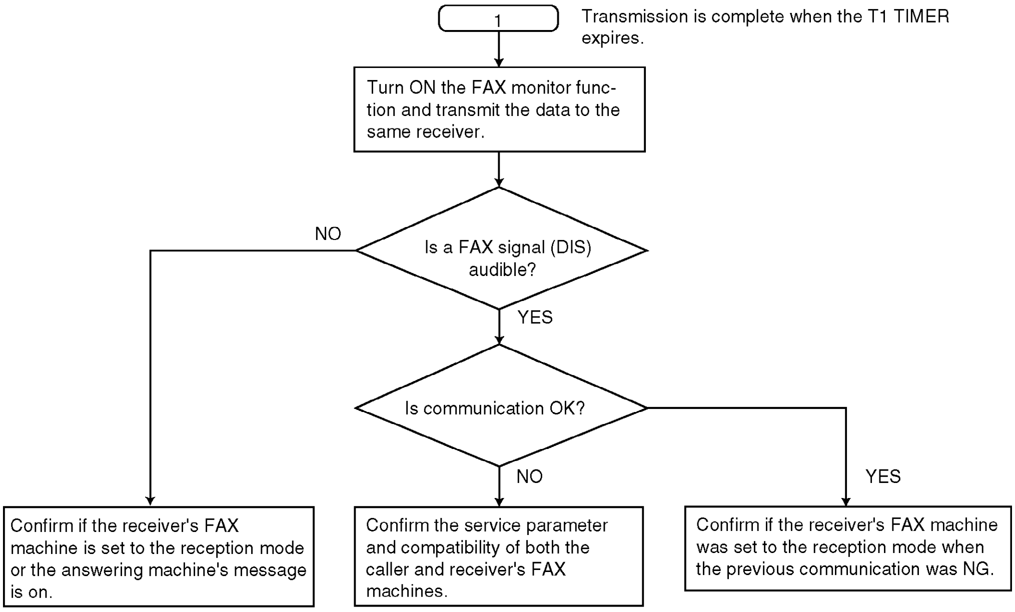
Most fax communication problems can be resolved by the following steps.

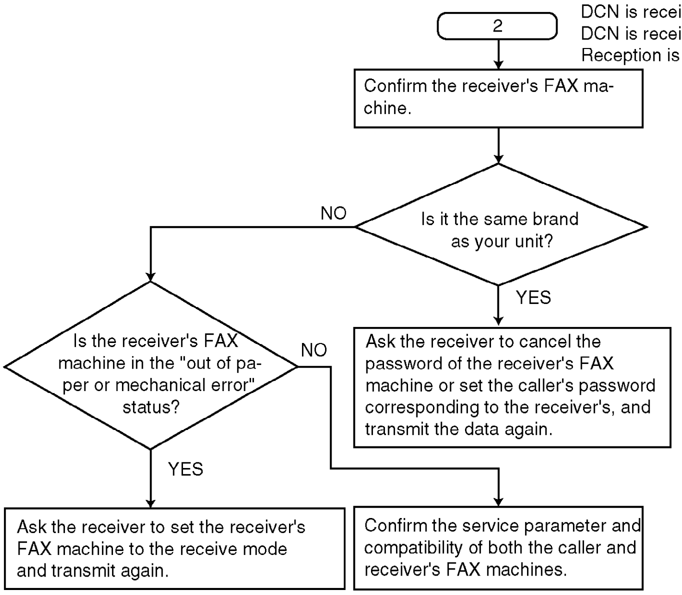
1. Change the transmit level. (Service code: 596, refer to SERVICE FUNCTION TABLE().)
2. Change the TX speed/RX speed. (Service code: 717/718, refer to SERVICE FUNCTION TABLE ().)

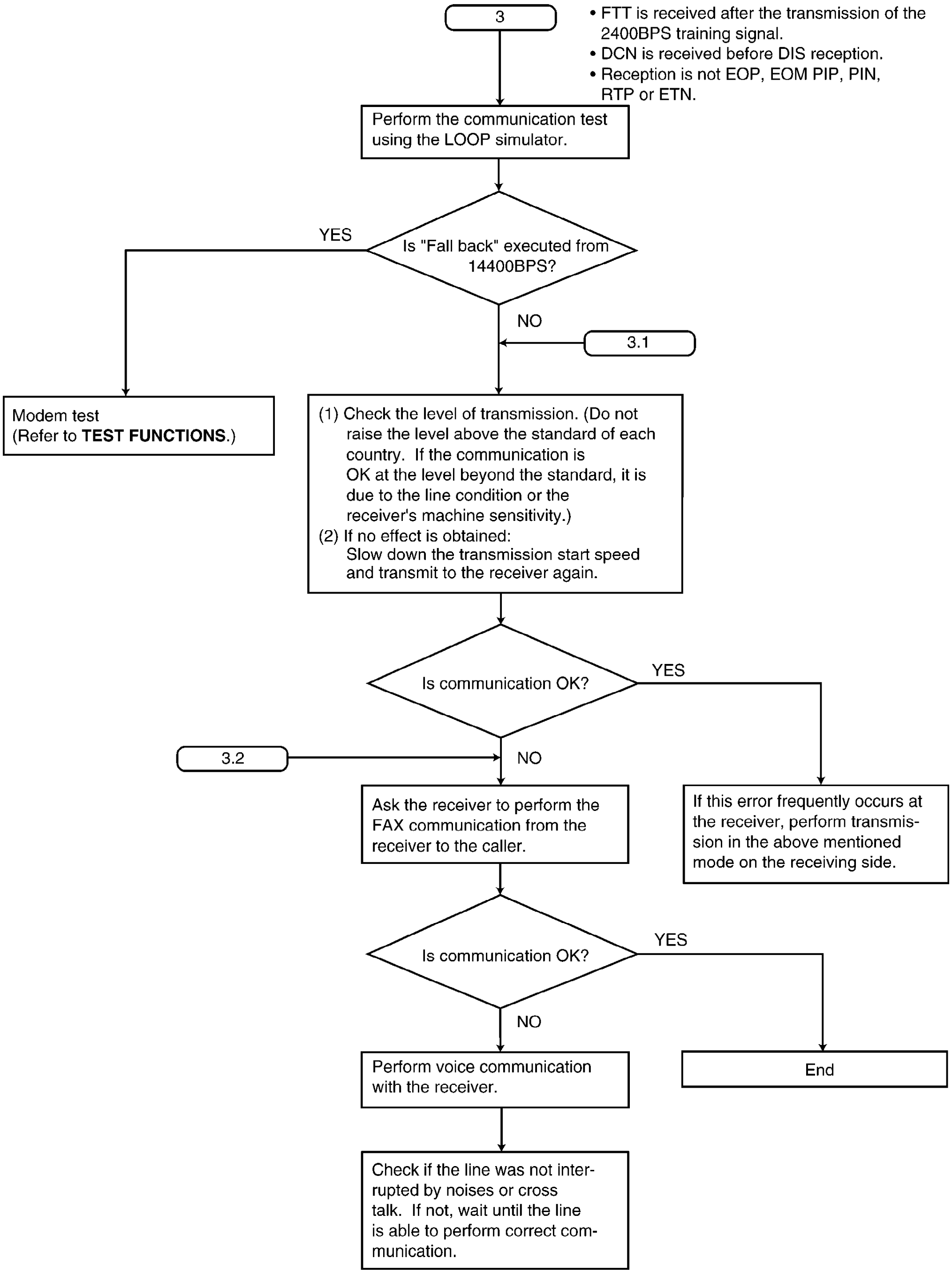
Note*:

If the problem remains, see the following “Countermeasure” flow chart.

Countermeasure

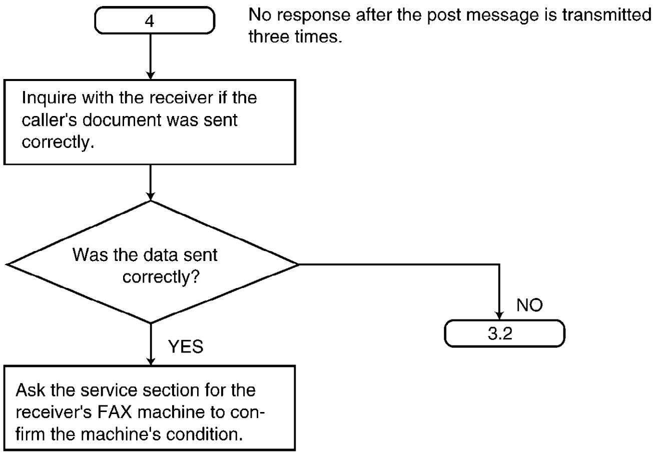

Transmission is complete when the T1 TIMER expires.
1
Turn ON the FAX monitor function and transmit the data to the same receiver.
Is a FAX signal (DIS) audible?
NO
YES
Is communication OK?
NO
YES
Confirm if the receiver's FAX machine is set to the reception mode or the answering machine's message is on.
Confirm the service parameter and compatibility of both the caller and receiver's FAX machines.
Confirm if the receiver's FAX machine was set to the reception mode when the previous communication was NG.

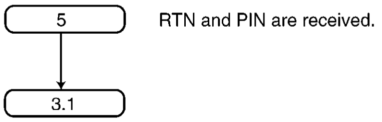

DCN is received after DCS transmission.
DCN is received after FTT transmission.
Reception is not EOP, EOM PIN, RTP or RTN.
2
Confirm the receiver's FAX machine.
Is it the same brand as your unit?
NO
YES
Is the receiver's FAX machine in the "out of paper or mechanical error" status?
NO
YES
Ask the receiver to cancel the password of the receiver's FAX machine or set the caller's password corresponding to the receiver's, and transmit the data again.
Ask the receiver to set the receiver's FAX machine to the receive mode and transmit again.
Confirm the service parameter and compatibility of both the caller and receiver's FAX machines.

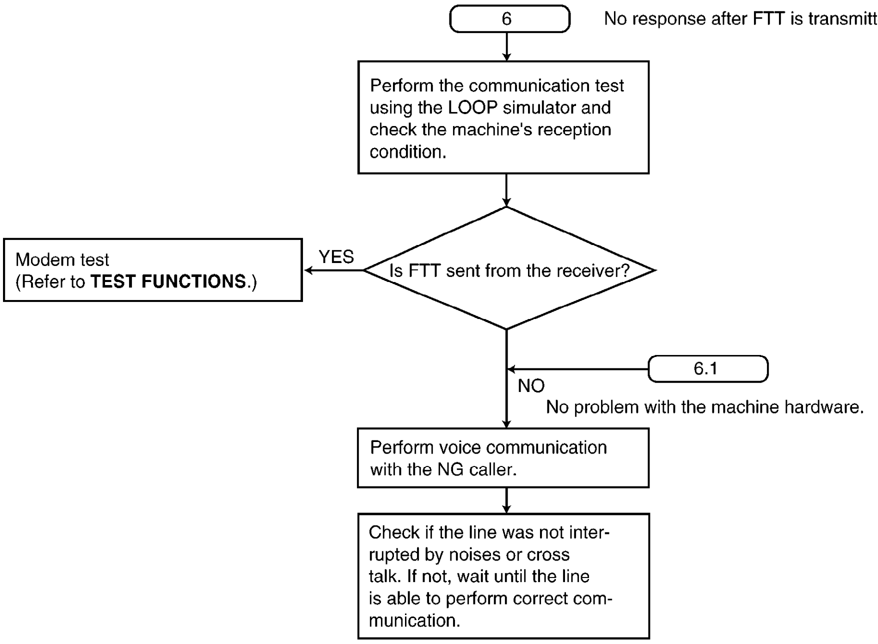

3
• FTT is received after the transmission of the 2400BPS training signal.
• DCN is received before DIS reception.
• Reception is not EOP, EOM PIP, PIN, RTP or ETN.
Perform the communication test using the LOOP simulator.
Is "Fall back" executed from 14400BPS?
YES
NO
3.1
Modem test (Refer to TEST FUNCTIONS.)
(1) Check the level of transmission. (Do not raise the level above the standard of each country. If the communication is OK at the level beyond the standard, it is due to the line condition or the receiver's machine sensitivity.)
(2) If no effect is obtained: Slow down the transmission start speed and transmit to the receiver again.
Is communication OK?
YES
NO
3.2
Ask the receiver to perform the FAX communication from the receiver to the caller.
If this error frequently occurs at the receiver, perform transmission in the above mentioned mode on the receiving side.
Is communication OK?
YES
NO
Perform voice communication with the receiver.
End
Check if the line was not interrupted by noises or cross talk. If not, wait until the line is able to perform correct communication.

CROSS REFERENCE:

TEST FUNCTIONS ()

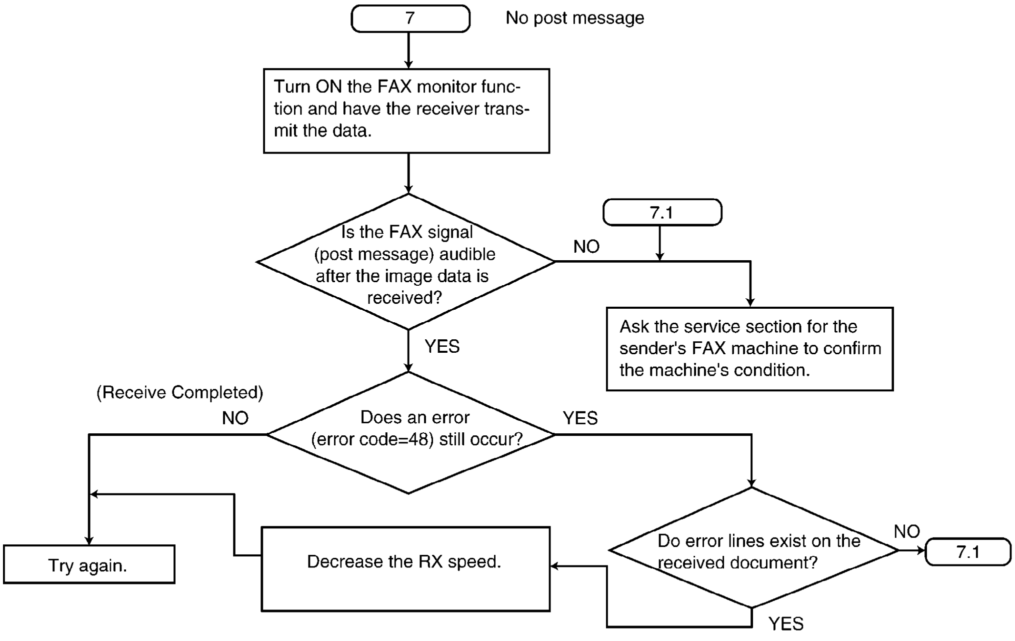

4
No response after the post message is transmitted three times.
Inquire with the receiver if the caller's document was sent correctly.
Was the data sent correctly?
NO
3.2
YES
Ask the service section for the receiver's FAX machine to confirm the machine's condition.

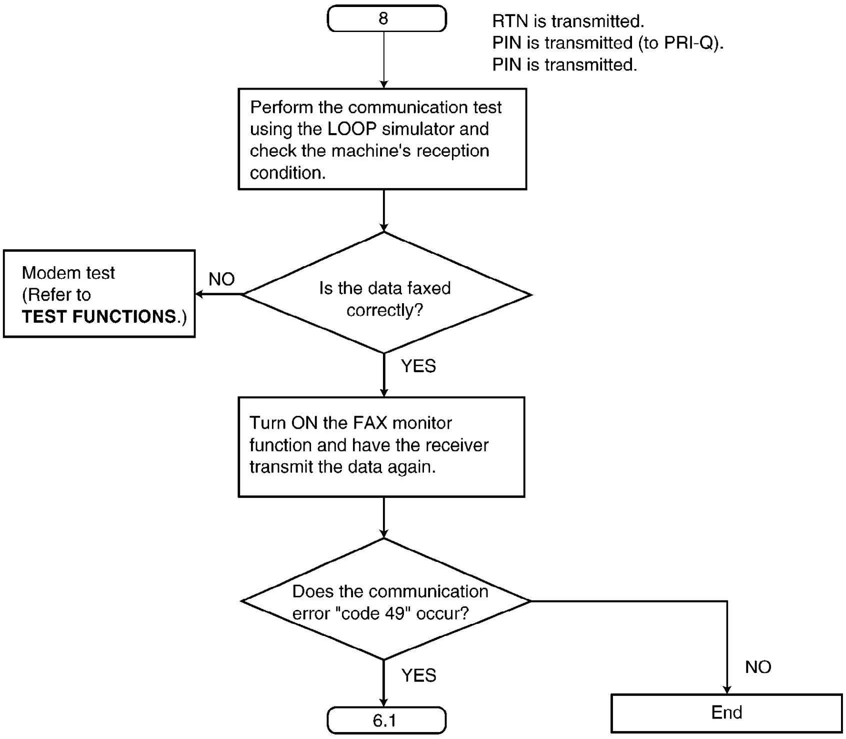

5
RTN and PIN are received.
3.1


6
No response after FTT is transmitted.
Perform the communication test using the LOOP simulator and check the machine's reception condition.
Is FTT sent from the receiver?
YES
Modem test
(Refer to TEST FUNCTIONS.)
6.1
NO
No problem with the machine hardware.
Perform voice communication with the NG caller.
Check if the line was not interrupted by noises or cross talk. If not, wait until the line is able to perform correct communication.

CROSS REFERENCE:

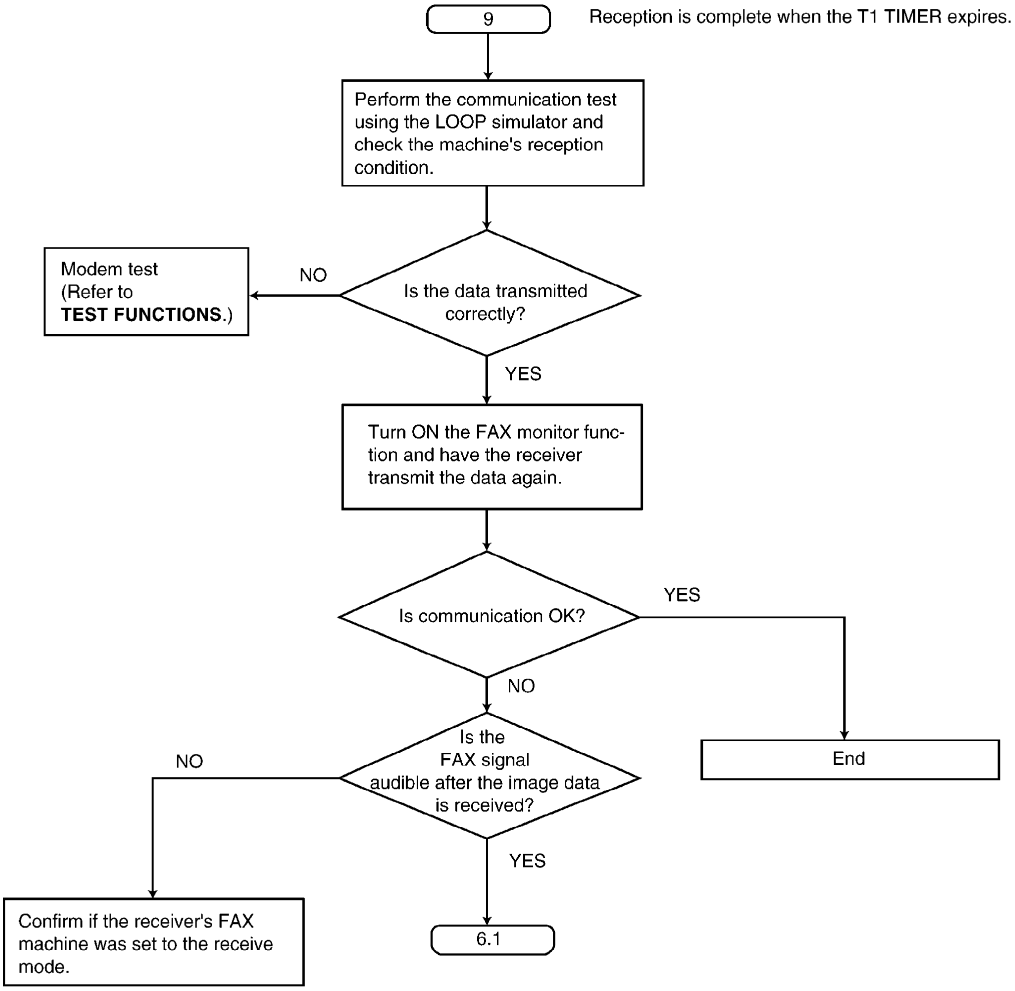
TEST FUNCTIONS ()


7
No post message
Turn ON the FAX monitor function and have the receiver transmit the data.
Is the FAX signal (post message) audible after the image data is received?
NO
7.1
Ask the service section for the sender's FAX machine to confirm the machine's condition.
YES
(Receive Completed)
NO
Does an error (error code=48) still occur?
YES
Try again.
Decrease the RX speed.
Do error lines exist on the received document?
NO
7.1
YES


8
RTN is transmitted.
PIN is transmitted (to PRI-Q).
PIN is transmitted.
Perform the communication test using the LOOP simulator and check the machine's reception condition.
Modem test (Refer to TEST FUNCTIONS.)
NO
Is the data faxed correctly?
YES
Turn ON the FAX monitor function and have the receiver transmit the data again.
Does the communication error "code 49" occur?
YES
NO
6.1
End

CROSS REFERENCE:

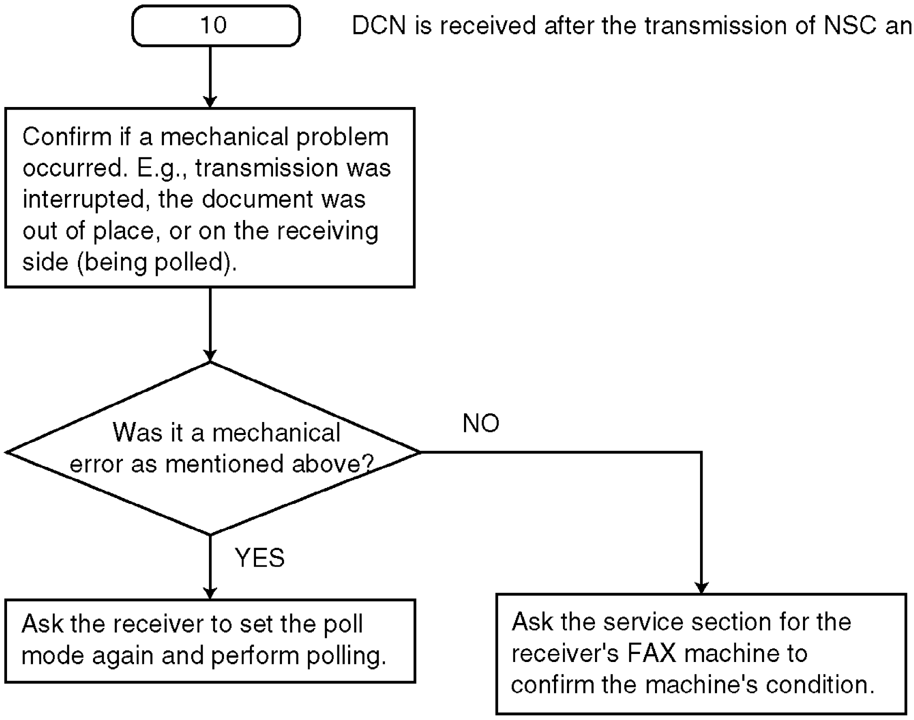
TEST FUNCTIONS ()


9
Reception is complete when the T1 TIMER expires.
Perform the communication test using the LOOP simulator and check the machine's reception condition.
Is the data transmitted correctly?
NO
Modem test (Refer to TEST FUNCTIONS.)
YES
Turn ON the FAX monitor function and have the receiver transmit the data again.
Is communication OK?
YES
End
NO
Is the FAX signal audible after the image data is received?
NO
Confirm if the receiver's FAX machine was set to the receive mode.
YES
6.1

CROSS REFERENCE:

TEST FUNCTIONS ()

DCN is received after the transmission of NSC and DTC.



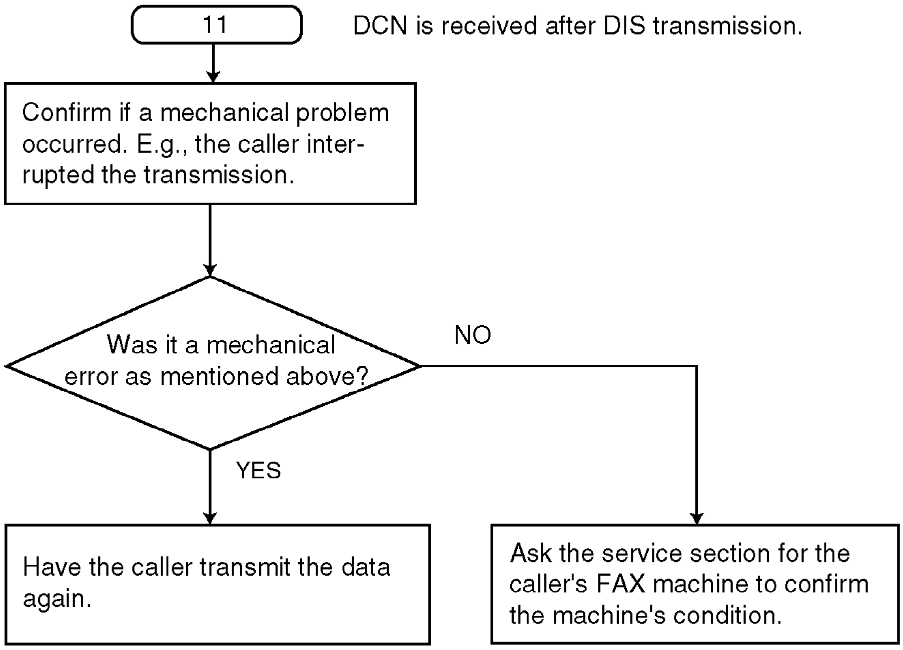
Confirm if a mechanical problem occurred. E.g., transmission was interrupted, the document was out of place, or on the receiving side (being polled).

Was it a mechanical error as mentioned above?

Ask the receiver to set the poll mode again and perform polling.

Ask the service section for the receiver's FAX machine to confirm the machine's condition.

DCN is received after DIS transmission.



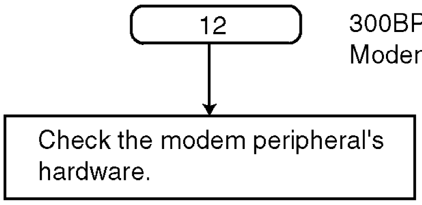
Confirm if a mechanical problem occurred. E.g., the caller interrupted the transmission.

Was it a mechanical error as mentioned above?

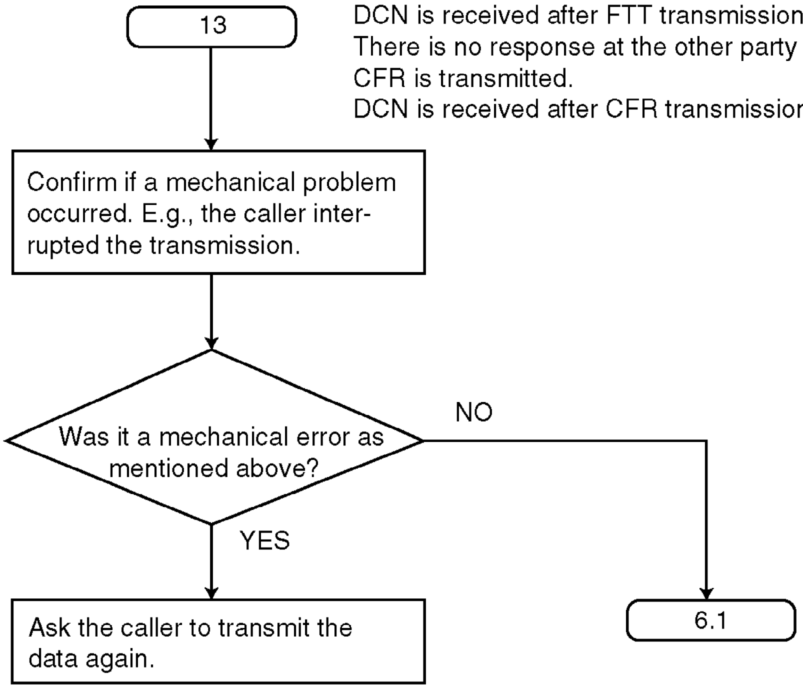
Have the caller transmit the data again.

Ask the service section for the caller's FAX machine to confirm the machine's condition.

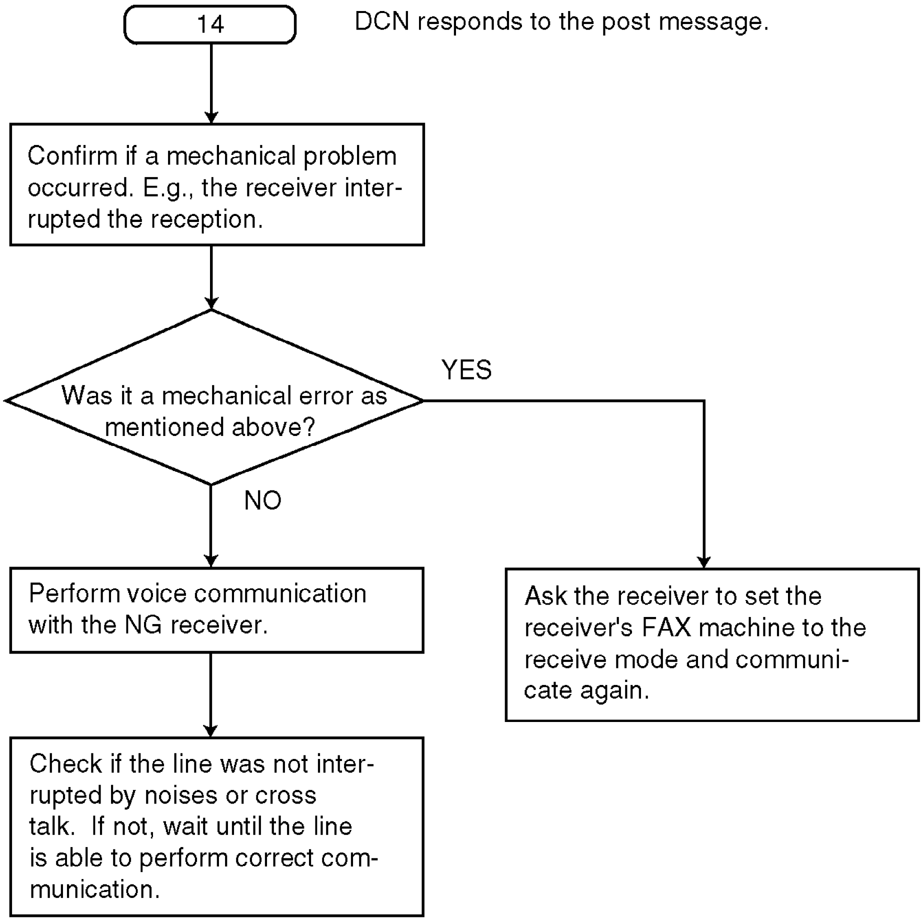
300BPS error
Modem error



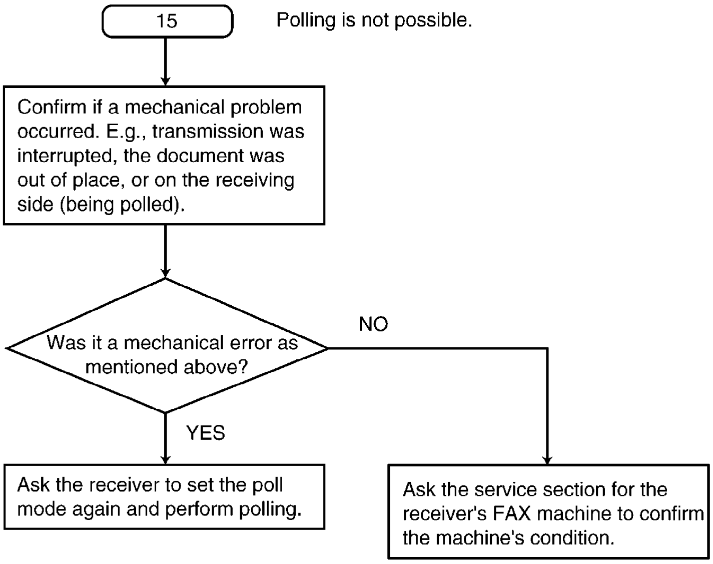
Check the modem peripheral's hardware.

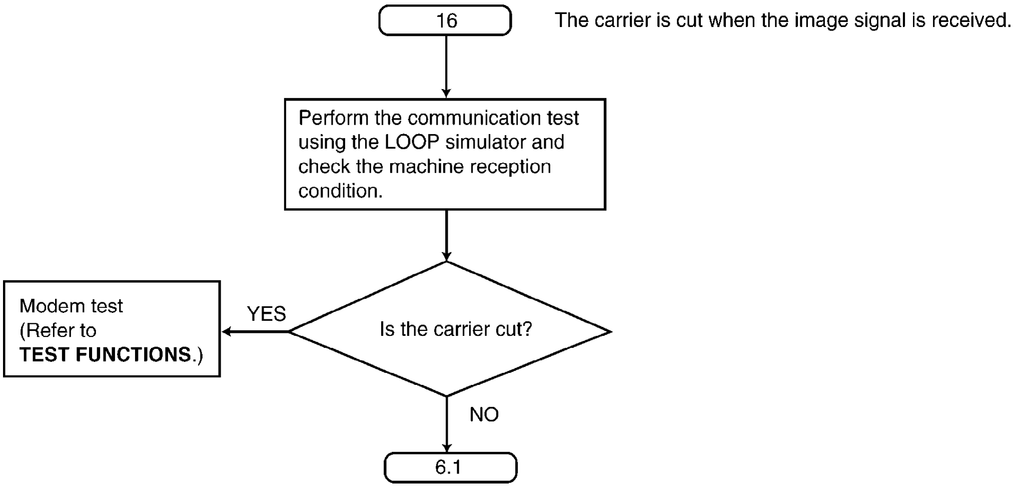

13
Confirm if a mechanical problem occurred. E.g., the caller interrupted the transmission.
Was it a mechanical error as mentioned above?
NO
YES
Ask the caller to transmit the data again.
6.1

DCN is received after FTT transmission.
There is no response at the other party after MCF or CFR is transmitted.
DCN is received after CFR transmission.


14
Confirm if a mechanical problem occurred. E.g., the receiver interrupted the reception.
Was it a mechanical error as mentioned above?
YES
NO
Perform voice communication with the NG receiver.
Check if the line was not interrupted by noises or cross talk. If not, wait until the line is able to perform correct communication.
Ask the receiver to set the receiver's FAX machine to the receive mode and communicate again.

DCN responds to the post message.

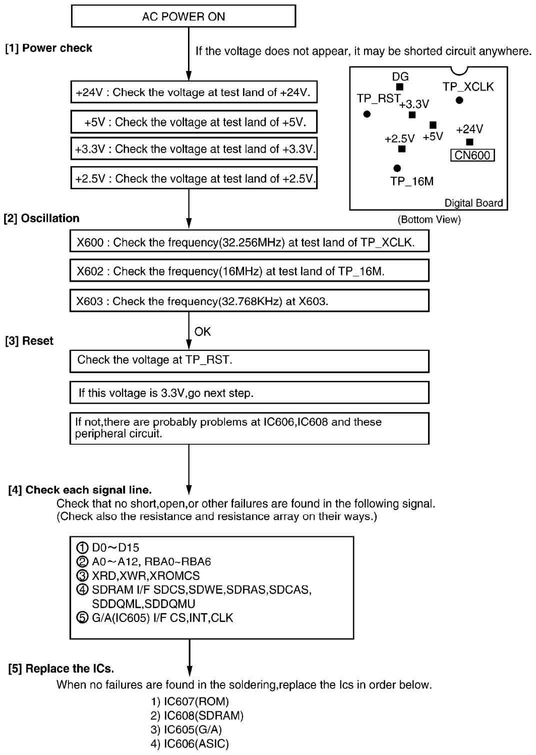

15
Polling is not possible.
Confirm if a mechanical problem occurred. E.g., transmission was interrupted, the document was out of place, or on the receiving side (being polled).
Was it a mechanical error as mentioned above?
NO
YES
Ask the receiver to set the poll mode again and perform polling.
Ask the service section for the receiver's FAX machine to confirm the machine's condition.


16
The carrier is cut when the image signal is received.
Perform the communication test using the LOOP simulator and check the machine reception condition.
Is the carrier cut?
YES
Modem test
(Refer to
TEST FUNCTIONS.)
NO
6.1

CROSS REFERENCE:
TEST FUNCTIONS ()

6.5.12. INITIALIZING ERROR

After the power is turned on, the ASIC (IC606) initializes and checks each IC.
The ROM (IC607), SDRAM (IC604), and MODEM (IC600) are checked.
If initialization fails for the ICs, the system will not boot up.
In this case, please find the cause as follows.


AC POWER ON

[1] Power check

If the voltage does not appear, it may be shorted circuit anywhere.

+24V : Check the voltage at test land of +24V.

+5V : Check the voltage at test land of +5V.

+3.3V : Check the voltage at test land of +3.3V.

+2.5V : Check the voltage at test land of +2.5V.

[2] Oscillation

X600 : Check the frequency(32.256MHz) at test land of TP_XCLK.

X602 : Check the frequency(16MHz) at test land of TP_16M.

X603 : Check the frequency(32.768KHz) at X603.

OK

[3] Reset

Check the voltage at TP_RST.

If this voltage is 3.3V,go next step.

If not,there are probably problems at IC606,IC608 and these peripheral circuit.

[4] Check each signal line.

Check that no short,open,or other failures are found in the following signal.
(Check also the resistance and resistance array on their ways.)

① D0~D15
② A0~A12, RBA0~RBA6
③ XRD,XWR,XROMCS
④ SDRAM I/F SDCS,SDWE,SDRAS,SDCAS, SDDQML,SDDQMU
⑤ G/A(IC605) I/F CS,INT,CLK

[5] Replace the ICs.

When no failures are found in the soldering,replace the Ics in order below.

1) IC607(ROM)
2) IC608(SDRAM)
3) IC605(G/A)
4) IC606(ASIC)

CROSS REFERENCE:

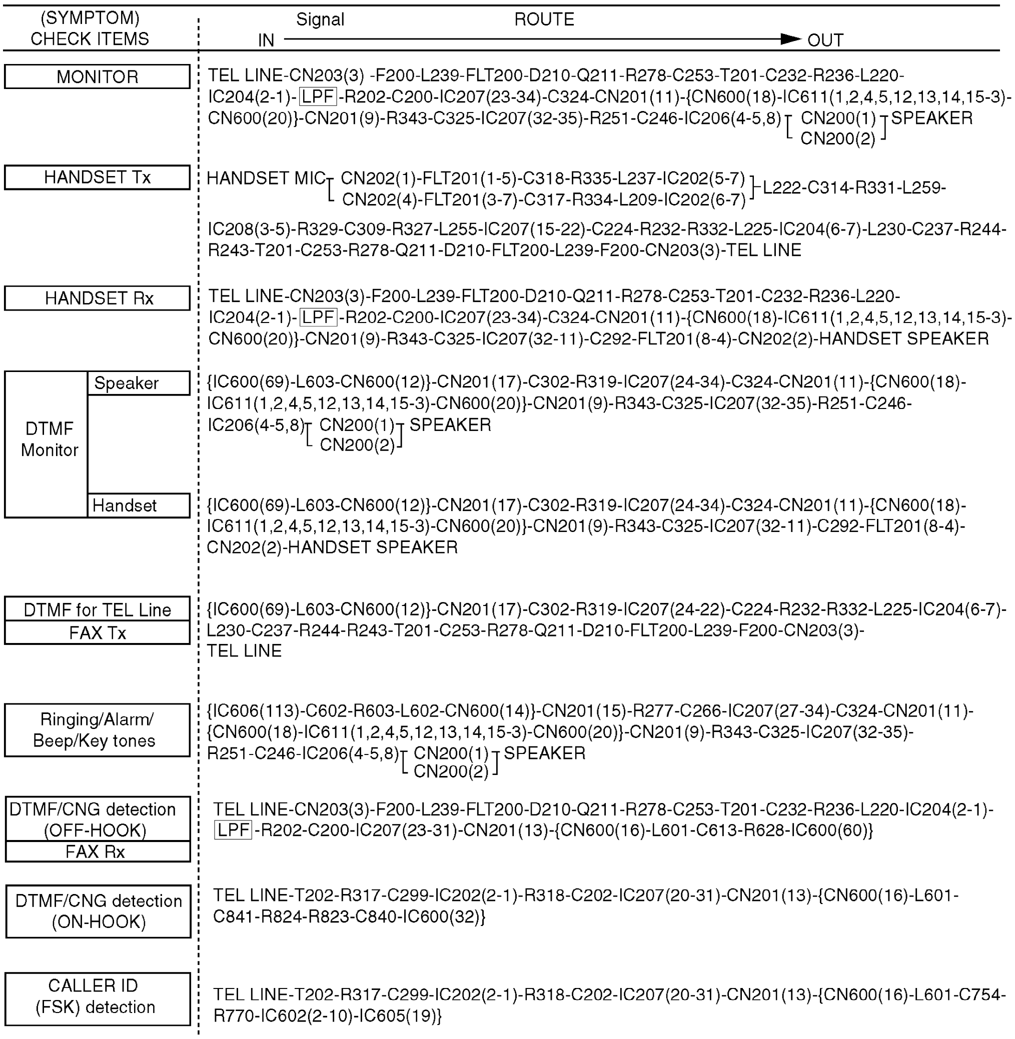
NG EXAMPLE ()

POWER SUPPLY BOARD SECTION ()

6.5.13. ANALOG BOARD SECTION

This chapter provides the testing procedures required for the analog parts. A signal route to be tested is determined depending upon purposes. For example, the handset TX route begins at the handset microphone and the signal is output to the telephone line. The signal mainly flowing on this route is analog. You can trace the signal with an oscilloscope. The signal flow on each route is shown in the Check Sheet here. If you find a specific problem in the unit, for example if you cannot communicate with the H/S, trace that signal route locally with the following Check Sheet and locate the faulty point.

6.5.13.1. CHECK SHEET



(SYMPTOM) CHECK ITEMS		Signal ROUTE IN → OUT
MONITOR		TEL LINE-CN203(3) -F200-L239-FLT200-D210-Q211-R278-C253-T201-C232-R236-L220- IC204(2-1)-LPF-R202-C200-IC207(23-34)-C324-CN201(11)-{CN600(18)-IC611(1,2,4,5,12,13,14,15-3)- CN600(20)}-CN201(9)-R343-C325-IC207(32-35)-R251-C246-IC206(4-5,8) CN200(1) SPEAKER CN200(2)
HANDSET Tx		HANDSET MIC CN202(1)-FLT201(1-5)-C318-R335-L237-IC202(5-7) L222-C314-R331-L259- CN202(4)-FLT201(3-7)-C317-R334-L209-IC202(6-7) IC208(3-5)-R329-C309-R327-L255-IC207(15-22)-C224-R232-R332-L225-IC204(6-7)-L230-C237-R244- R243-T201-C253-R278-Q211-D210-FLT200-L239-F200-CN203(3)-TEL LINE
HANDSET Rx		TEL LINE-CN203(3)-F200-L239-FLT200-D210-Q211-R278-C253-T201-C232-R236-L220- IC204(2-1)-LPF-R202-C200-IC207(23-34)-C324-CN201(11)-{CN600(18)-IC611(1,2,4,5,12,13,14,15-3)- CN600(20)}-CN201(9)-R343-C325-IC207(32-11)-C292-FLT201(8-4)-CN202(2)-HANDSET SPEAKER
DTMF Monitor	Speaker	{IC600(69)-L603-CN600(12)}-CN201(17)-C302-R319-IC207(24-34)-C324-CN201(11)-{CN600(18)- IC611(1,2,4,5,12,13,14,15-3)-CN600(20)}-CN201(9)-R343-C325-IC207(32-35)-R251-C246- IC206(4-5,8) CN200(1) SPEAKER CN200(2)
	Handset	{IC600(69)-L603-CN600(12)}-CN201(17)-C302-R319-IC207(24-34)-C324-CN201(11)-{CN600(18)- IC611(1,2,4,5,12,13,14,15-3)-CN600(20)}-CN201(9)-R343-C325-IC207(32-11)-C292-FLT201(8-4)- CN202(2)-HANDSET SPEAKER
DTMF for TEL Line FAX Tx		{IC600(69)-L603-CN600(12)}-CN201(17)-C302-R319-IC207(24-22)-C224-R232-R332-L225-IC204(6-7)- L230-C237-R244-R243-T201-C253-R278-Q211-D210-FLT200-L239-F200-CN203(3)- TEL LINE
Ringing/Alarm/ Beep/Key tones		{IC606(113)-C602-R603-L602-CN600(14)}-CN201(15)-R277-C266-IC207(27-34)-C324-CN201(11)- {CN600(18)-IC611(1,2,4,5,12,13,14,15-3)-CN600(20)}-CN201(9)-R343-C325-IC207(32-35)- R251-C246-IC206(4-5,8) CN200(1) SPEAKER CN200(2)
DTMF/CNG detection (OFF-HOOK) FAX Rx		TEL LINE-CN203(3)-F200-L239-FLT200-D210-Q211-R278-C253-T201-C232-R236-L220-IC204(2-1)- LPF-R202-C200-IC207(23-31)-CN201(13)-{CN600(16)-L601-C613-R628-IC600(60)}
DTMF/CNG detection (ON-HOOK)		TEL LINE-T202-R317-C299-IC202(2-1)-R318-C202-IC207(20-31)-CN201(13)-{CN600(16)-L601- C841-R824-R823-C840-IC600(32)}
CALLER ID (FSK) detection		TEL LINE-T202-R317-C299-IC202(2-1)-R318-C202-IC207(20-31)-CN201(13)-{CN600(16)-L601-C754- R770-IC602(2-10)-IC605(19)}

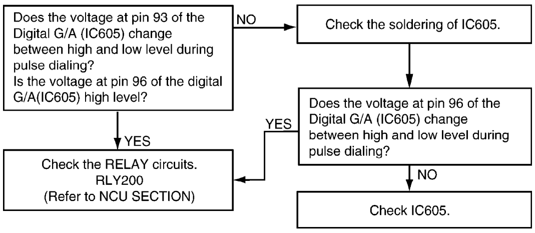
Note: { }: Inside the digital board

6.5.13.2. DEFECTIVE ITS (Integrated Telephone System) SECTION

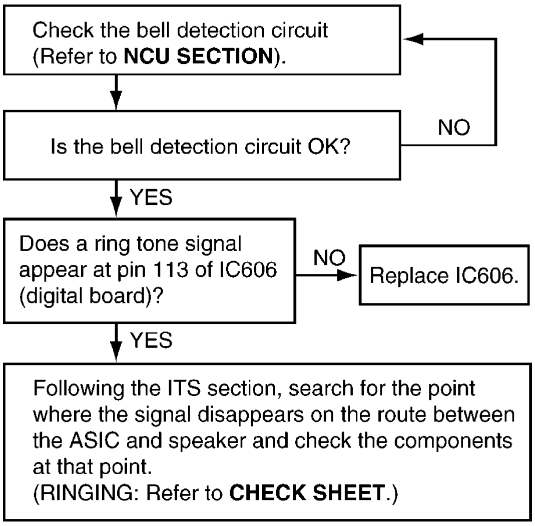
1. No handset and speakerphone transmission / reception

Perform a signal test in the ITS or the NCU section and locate a defective point (where the signal disappears) on each route between the handset microphone and telephone line (sending), or between the telephone line and the handset speaker (receiving), or between the microphone and the telephone line (sending), or between the telephone line and the speaker (receiving). Check the components at that point. CHECK SHEET() is useful for this investigation.

2. No pulse dialing


Does the voltage at pin 93 of the Digital G/A (IC605) change between high and low level during pulse dialing?
Is the voltage at pin 96 of the digital G/A(IC605) high level?
NO
Check the soldering of IC605.
YES
Check the RELAY circuits. RLY200 (Refer to NCU SECTION)
YES
Does the voltage at pin 96 of the Digital G/A (IC605) change between high and low level during pulse dialing?
NO
Check IC605.

3. No ring tone (or No bell)

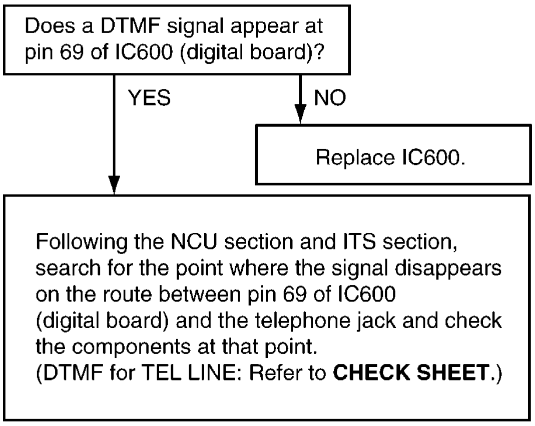

Check the bell detection circuit
(Refer to NCU SECTION).
Is the bell detection circuit OK?
NO
YES
Does a ring tone signal appear at pin 113 of IC606 (digital board)?
NO
Replace IC606.
YES
Following the ITS section, search for the point where the signal disappears on the route between the ASIC and speaker and check the components at that point.
(RINGING: Refer to CHECK SHEET.)

CROSS REFERENCE:

CHECK SHEET ()

NCU SECTION ()

4. No tone dialing

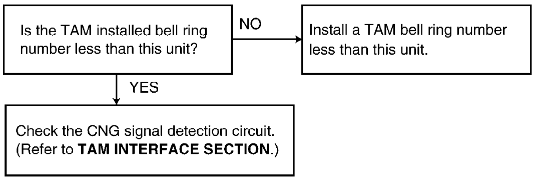

Does a DTMF signal appear at pin 69 of IC600 (digital board)?
YES
NO
Replace IC600.
Following the NCU section and ITS section, search for the point where the signal disappears on the route between pin 69 of IC600 (digital board) and the telephone jack and check the components at that point.
(DTMF for TEL LINE: Refer to CHECK SHEET.)

CROSS REFERENCE:

CHECK SHEET ()

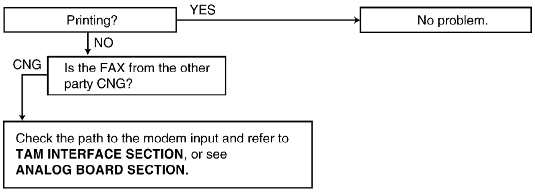
6.5.13.3. DETECTIVE TAM INTERFACE SECTION

1. The FAX turns on, but does not arrive through TAM.


Is the TAM installed bell ring number less than this unit?
NO
Install a TAM bell ring number less than this unit.
YES
Check the CNG signal detection circuit. (Refer to TAM INTERFACE SECTION.)

CROSS REFERENCE:
TAM INTERFACE SECTION ()

2. A FAX is received, but won't switch from TAM to FAX.

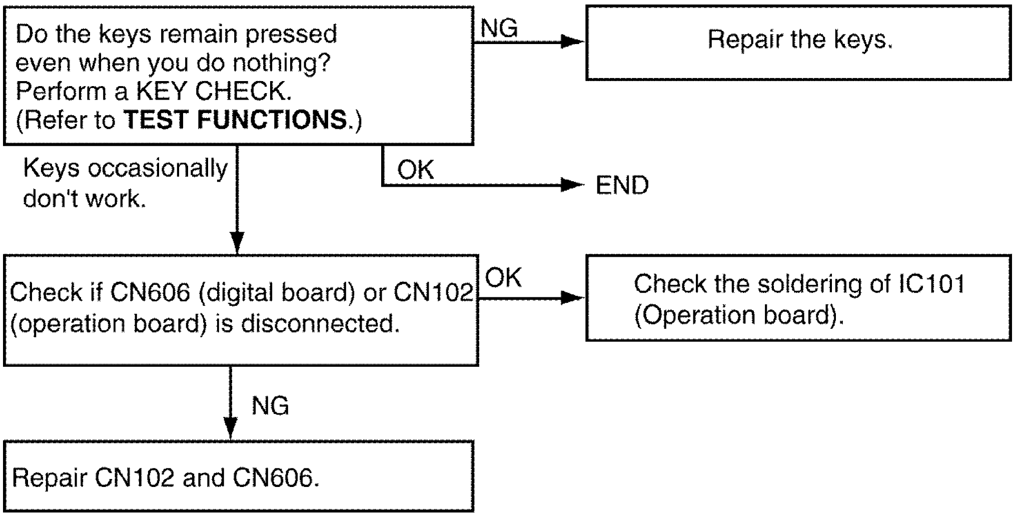

Printing?
YES
No problem.
NO
CNG
Is the FAX from the other party CNG?
Check the path to the modem input and refer to TAM INTERFACE SECTION, or see ANALOG BOARD SECTION.

CROSS REFERENCE:
ANALOG BOARD SECTION ()
TAM INTERFACE SECTION ()

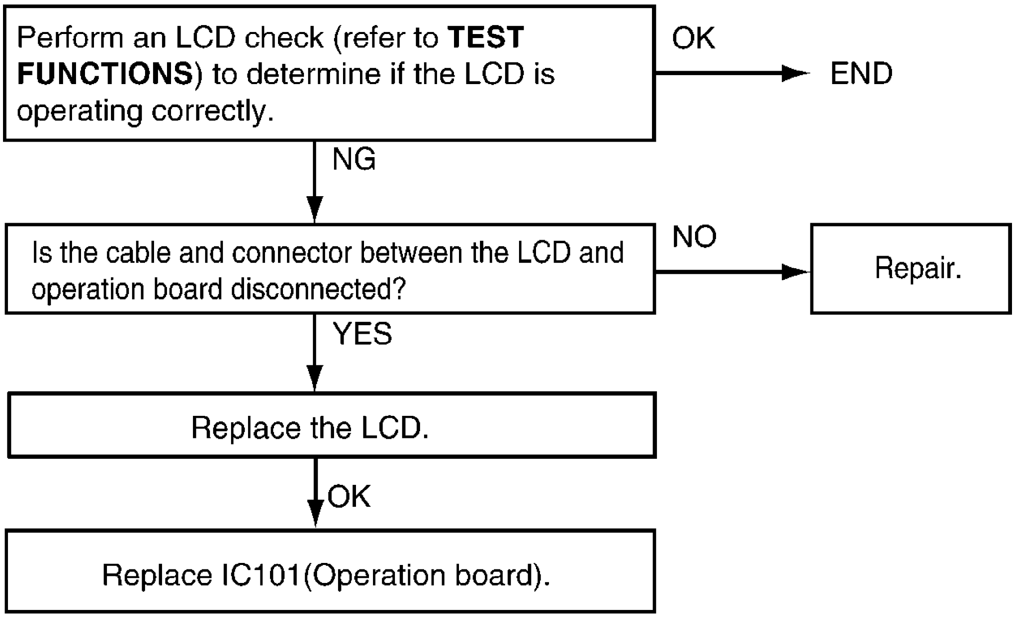
6.5.13.4. OPERATION PANEL SECTION

Refer to TEST FUNCTIONS ().

1. NO KEY OPERATION


Do the keys remain pressed even when you do nothing? Perform a KEY CHECK. (Refer to TEST FUNCTIONS.)
NG
Repair the keys.
Keys occasionally don't work.
OK
END
Check if CN606 (digital board) or CN102 (operation board) is disconnected.
OK
Check the soldering of IC101 (Operation board).
NG
Repair CN102 and CN606.

2. NO LCD INDICATION

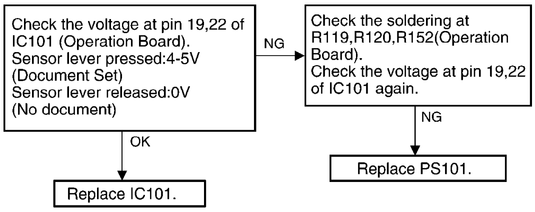

Perform an LCD check (refer to TEST FUNCTIONS) to determine if the LCD is operating correctly.
OK
END
NG
Is the cable and connector between the LCD and operation board disconnected?
NO
Repair.
YES
Replace the LCD.
OK
Replace IC101(Operation board).

CROSS REFERENCE:
TEST FUNCTIONS ()

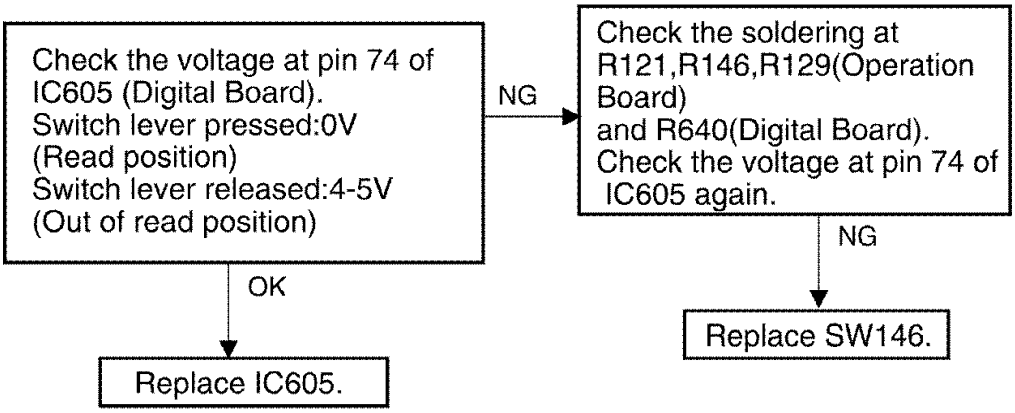
6.5.13.5. SENSOR SECTION

Refer to SENSORS AND SWITCHES for the circuit description.
Perform an SENSOR CHECK to determine if the sensor is operating correctly.

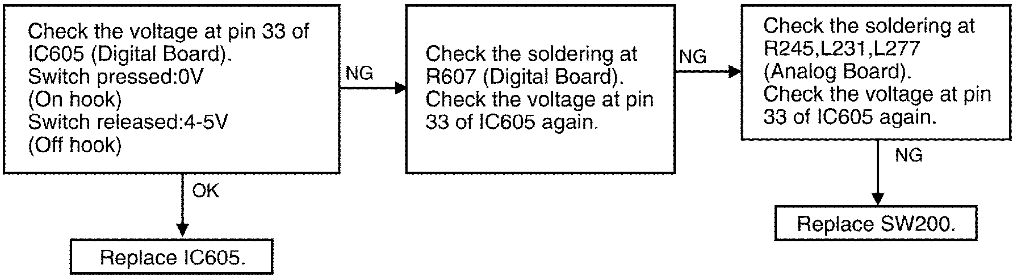
1. Check the .... “CHECK DOCUMENT”


Check the voltage at pin 19,22 of IC101 (Operation Board).
Sensor lever pressed:4-5V
(Document Set)
Sensor lever released:0V
(No document)
NG
Check the soldering at R119,R120,R152(Operation Board).
Check the voltage at pin 19,22 of IC101 again.
NG
Replace PS101.
OK
Replace IC101.

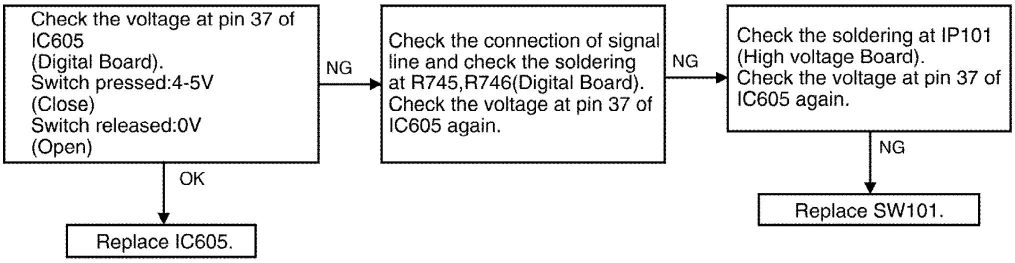
2. Check the paper feed sensor.......... “REMOVE DOCUMENT”


Check the voltage at pin 74 of IC605 (Digital Board).
Switch lever pressed:0V
(Read position)
Switch lever released:4-5V
(Out of read position)
NG
Check the soldering at R121,R146,R129(Operation Board)
and R640(Digital Board).
Check the voltage at pin 74 of IC605 again.
NG
Replace SW146.
OK
Replace IC605.

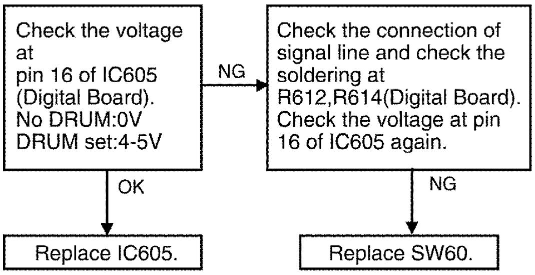
3. Check the hook switch


Check the voltage at pin 33 of IC605 (Digital Board).
Switch pressed:0V
(On hook)
Switch released:4-5V
(Off hook)
NG
Check the soldering at R607 (Digital Board).
Check the voltage at pin 33 of IC605 again.
NG
Check the soldering at R245,L231,L277 (Analog Board).
Check the voltage at pin 33 of IC605 again.
NG
Replace SW200.
OK
Replace IC605.

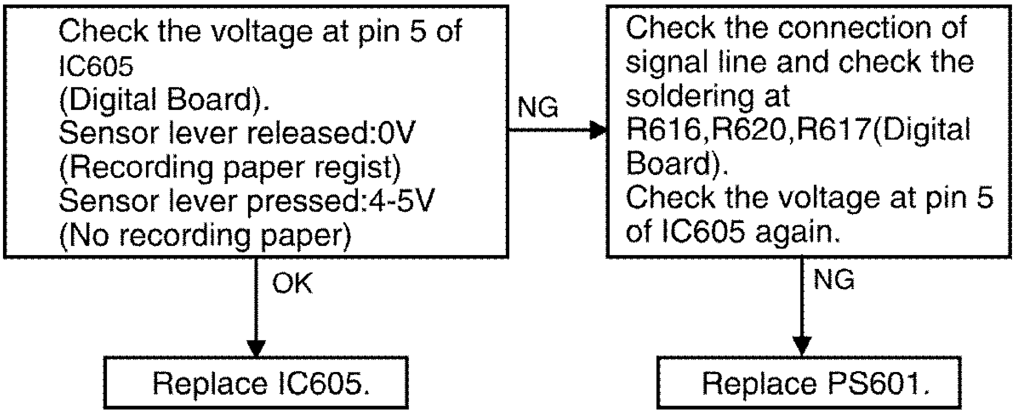
4. Check the cover open switch.......... “COVER OPEN”


Check the voltage at pin 37 of IC605
(Digital Board).
Switch pressed:4-5V
(Close)
Switch released:0V
(Open)
NG
Check the connection of signal line and check the soldering at R745,R746(Digital Board).
Check the voltage at pin 37 of IC605 again.
NG
Check the soldering at IP101 (High voltage Board).
Check the voltage at pin 37 of IC605 again.
NG
Replace SW101.
OK
Replace IC605.

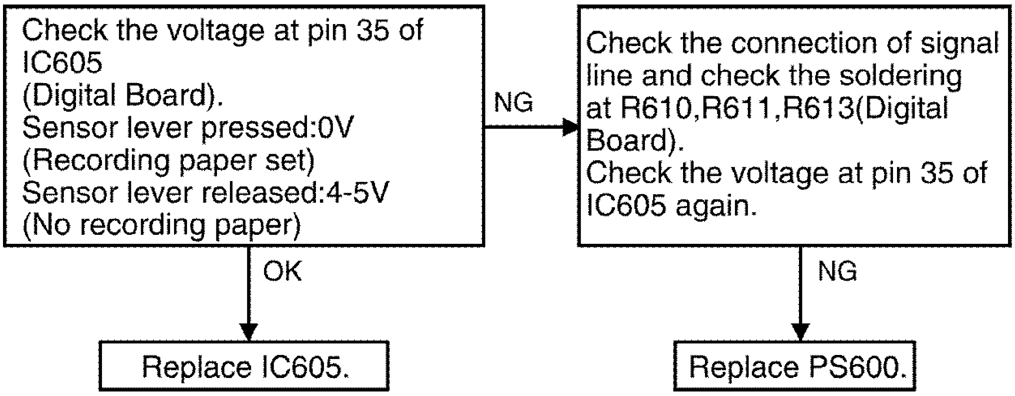
5. Check the DRUM sensor.......... “CHECK DRUM”


Check the voltage at
pin 16 of IC605
(Digital Board).
No DRUM:0V
DRUM set:4-5V
NG
Check the connection of signal line and check the soldering at R612,R614(Digital Board).
Check the voltage at pin 16 of IC605 again.
OK
Replace IC605.
NG
Replace SW60.

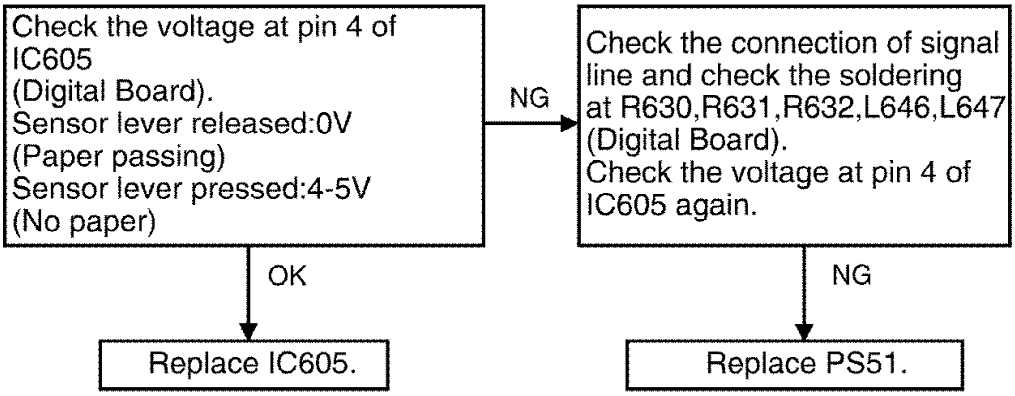
6. Check the regist sensor.......... “FAILED PICKUP”


Check the voltage at pin 5 of IC605
(Digital Board).
Sensor lever released:0V
(Recording paper regist)
Sensor lever pressed:4-5V
(No recording paper)
NG
Check the connection of signal line and check the soldering at R616,R620,R617(Digital Board).
Check the voltage at pin 5 of IC605 again.
OK
Replace IC605.
NG
Replace PS601.

7. Check the paper sensor.......... “OUT OF PAPER”

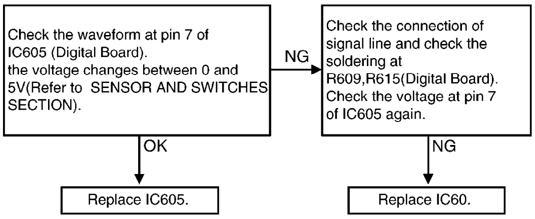

Check the voltage at pin 35 of IC605 (Digital Board).
Sensor lever pressed:0V (Recording paper set)
Sensor lever released:4-5V (No recording paper)
NG
Check the connection of signal line and check the soldering at R610,R611,R613(Digital Board).
Check the voltage at pin 35 of IC605 again.
OK
Replace IC605.
NG
Replace PS600.

8. Check the exit switch.......... “PAPER JAMMED”


Check the voltage at pin 4 of IC605 (Digital Board).
Sensor lever released:0V (Paper passing)
Sensor lever pressed:4-5V (No paper)
NG
Check the connection of signal line and check the soldering at R630,R631,R632,L646,L647 (Digital Board).
Check the voltage at pin 4 of IC605 again.
OK
Replace IC605.
NG
Replace PS51.

9. Check the toner sensor.......... “TONER LOW”, “CHANGE DRUM”

As for the following check, remove the drum from the main body, set it again and close the cover, then perform that check during initializing operation. Refer to SENSORS AND SWITCHES SECTION ().

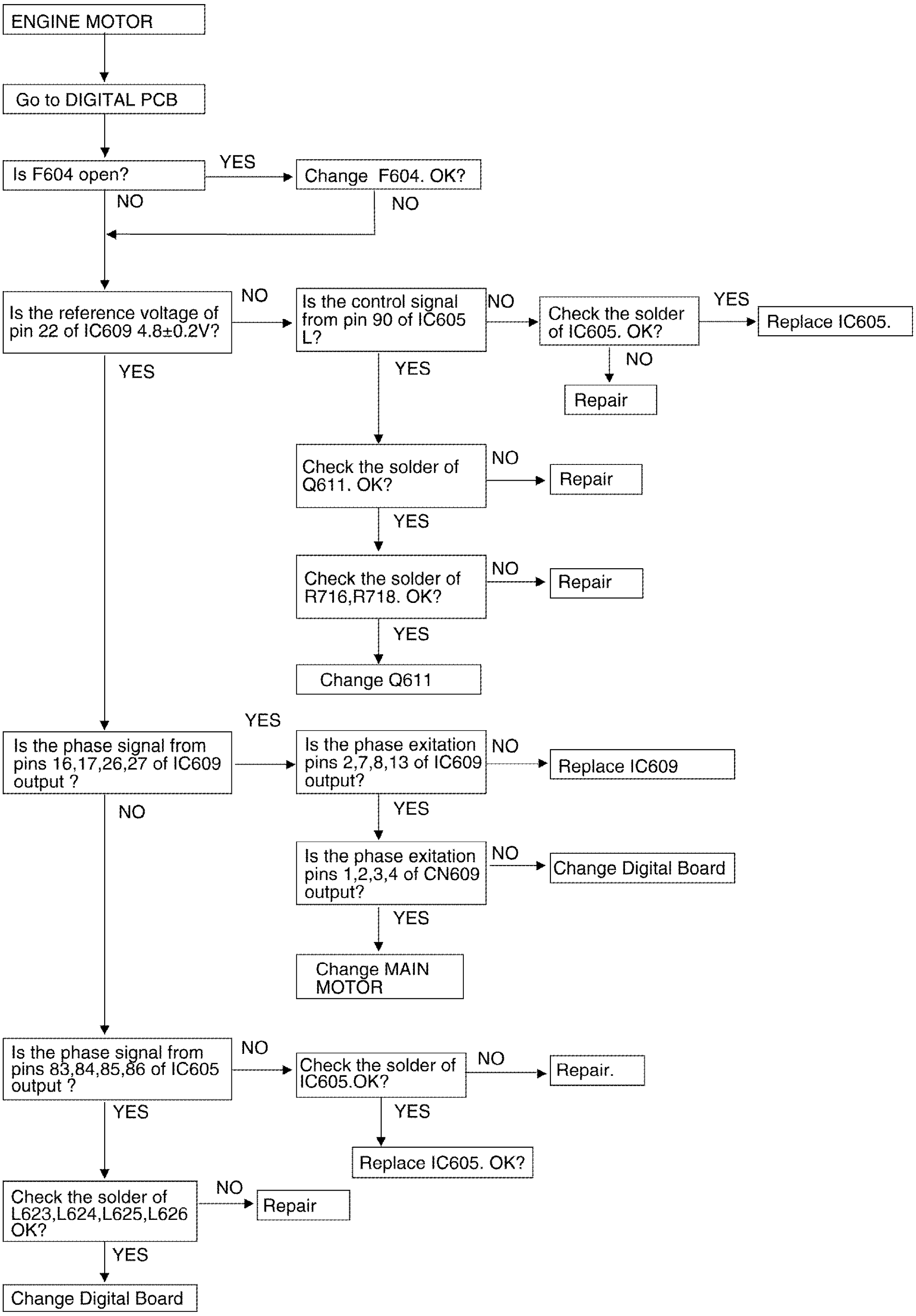

Check the waveform at pin 7 of IC605 (Digital Board). the voltage changes between 0 and 5V(Refer to SENSOR AND SWITCHES SECTION).
NG
Check the connection of signal line and check the soldering at R609,R615(Digital Board). Check the voltage at pin 7 of IC605 again.
OK
Replace IC605.
NG
Replace IC60.

CROSS REFERENCE:

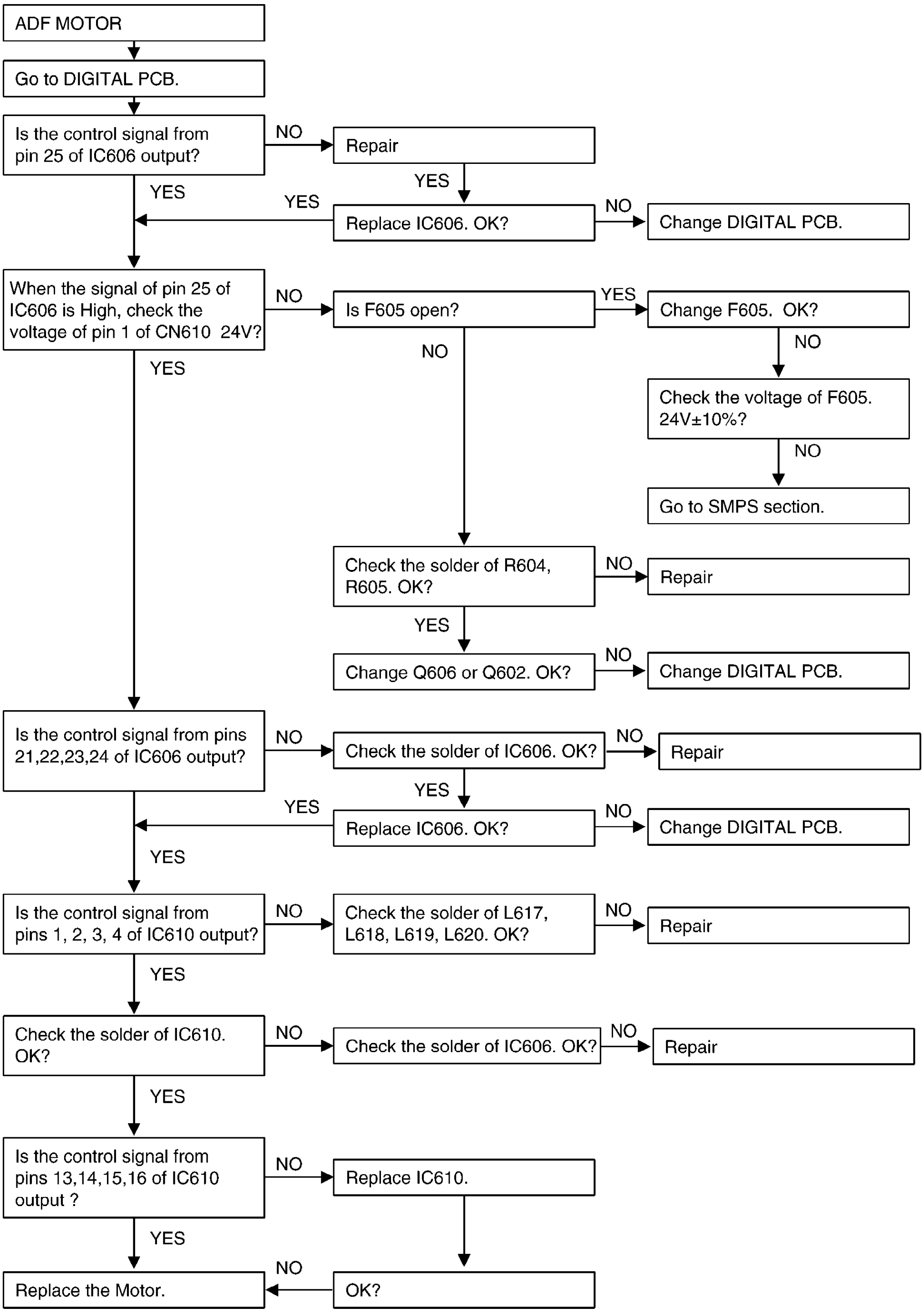
SENSORS AND SWITCHES SECTION ()

6.5.13.6. MOTOR SECTION

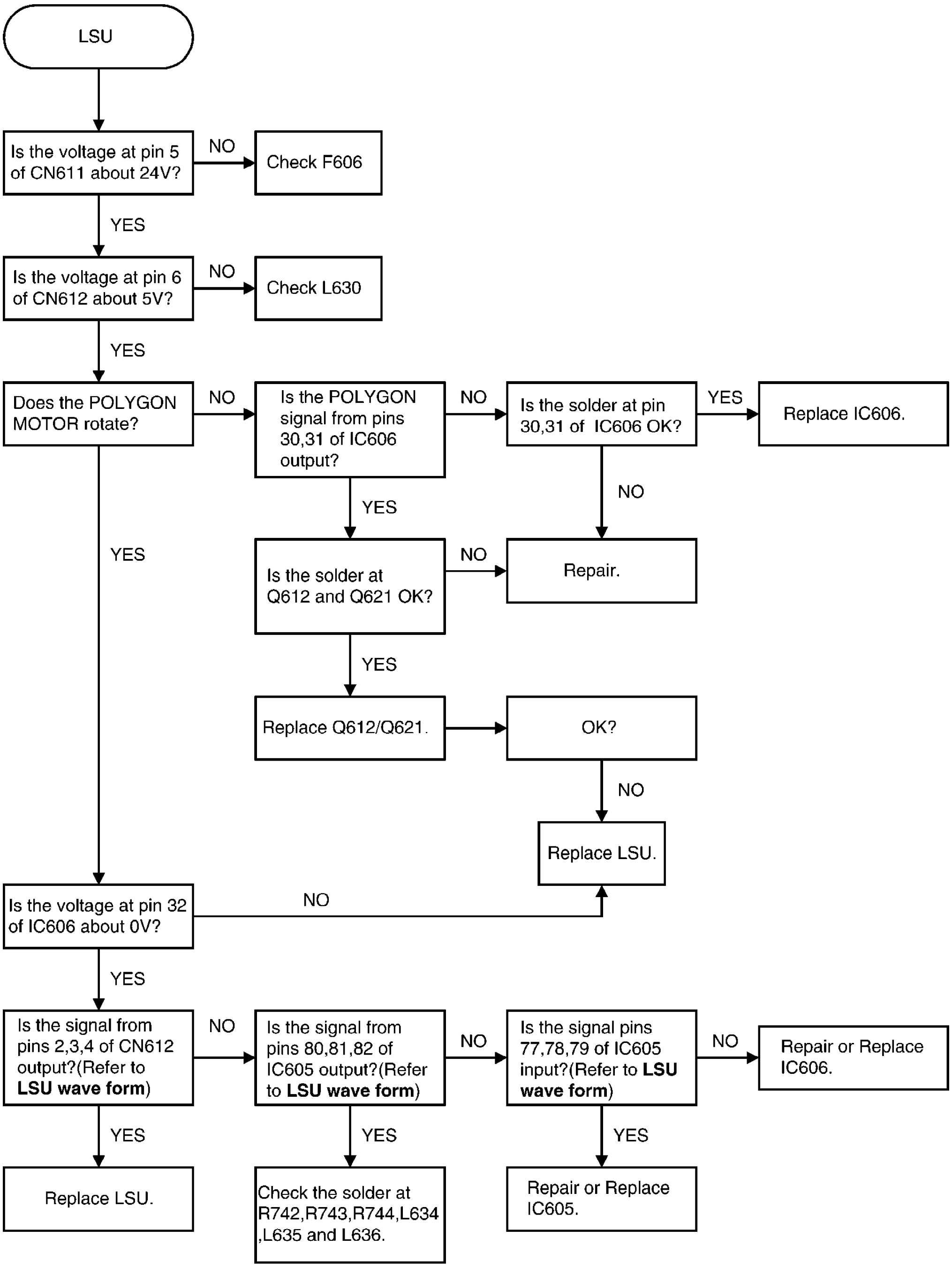
6.5.13.6.1. ENGINE MOTOR


ENGINE MOTOR
Go to DIGITAL PCB
Is F604 open?
YES
Change F604. OK?
NO
NO
Is the reference voltage of pin 22 of IC609 4.8±0.2V?
NO
Is the control signal from pin 90 of IC605 L?
NO
Check the solder of IC605. OK?
YES
Replace IC605.
NO
Repair
YES
YES
Check the solder of Q611. OK?
NO
Repair
YES
Check the solder of R716,R718. OK?
NO
Repair
YES
Change Q611
YES
Is the phase signal from pins 16,17,26,27 of IC609 output ?
Is the phase exitation pins 2,7,8,13 of IC609 output?
NO
Replace IC609
YES
Is the phase exitation pins 1,2,3,4 of CN609 output?
NO
Change Digital Board
YES
Change MAIN MOTOR
NO
Is the phase signal from pins 83,84,85,86 of IC605 output ?
NO
Check the solder of IC605.OK?
NO
Repair.
YES
Replace IC605. OK?
YES
Check the solder of L623,L624,L625,L626 OK?
NO
Repair
YES
Change Digital Board

6.5.13.6.2. ADF MOTOR


ADF MOTOR
Go to DIGITAL PCB.
Is the control signal from pin 25 of IC606 output?
NO
Repair
YES
YES
Replace IC606. OK?
NO
Change DIGITAL PCB.
YES
When the signal of pin 25 of IC606 is High, check the voltage of pin 1 of CN610 24V?
NO
Is F605 open?
YES
Change F605. OK?
NO
Check the voltage of F605. 24V±10%?
NO
Go to SMPS section.
NO
YES
Check the solder of R604, R605. OK?
NO
Repair
YES
Change Q606 or Q602. OK?
NO
Change DIGITAL PCB.
Is the control signal from pins 21,22,23,24 of IC606 output?
NO
Check the solder of IC606. OK?
NO
Repair
YES
YES
Replace IC606. OK?
NO
Change DIGITAL PCB.
YES
Is the control signal from pins 1, 2, 3, 4 of IC610 output?
NO
Check the solder of L617, L618, L619, L620. OK?
NO
Repair
YES
Check the solder of IC610. OK?
NO
Check the solder of IC606. OK?
NO
Repair
YES
Is the control signal from pins 13,14,15,16 of IC610 output ?
NO
Replace IC610.
YES
Replace the Motor.
NO
OK?

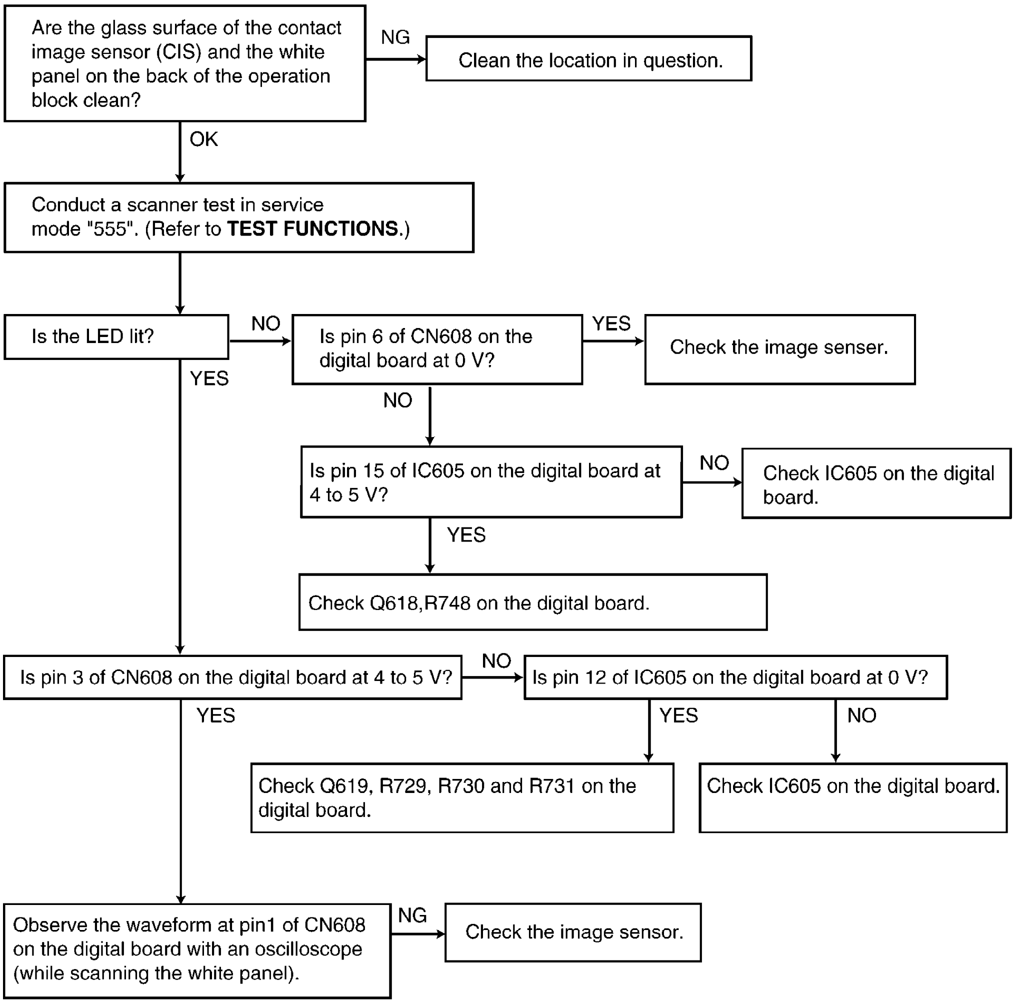
6.5.13.7. LSU SECTION

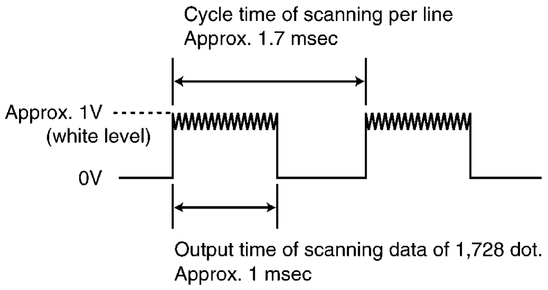

LSU
Is the voltage at pin 5 of CN611 about 24V?
NO
Check F606
YES
Is the voltage at pin 6 of CN612 about 5V?
NO
Check L630
YES
Does the POLYGON MOTOR rotate?
NO
Is the POLYGON signal from pins 30,31 of IC606 output?
NO
Is the solder at pin 30,31 of IC606 OK?
YES
Replace IC606.
NO
YES
Is the solder at Q612 and Q621 OK?
NO
Repair.
YES
YES
Replace Q612/Q621.
OK?
NO
Replace LSU.
Is the voltage at pin 32 of IC606 about 0V?
NO
YES
Is the signal from pins 2,3,4 of CN612 output?(Refer to LSU wave form)
NO
Is the signal from pins 80,81,82 of IC605 output?(Refer to LSU wave form)
NO
Is the signal pins 77,78,79 of IC605 input?(Refer to LSU wave form)
NO
Repair or Replace IC606.
YES
Replace LSU.
YES
Check the solder at R742,R743,R744,L634 ,L635 and L636.
YES
Repair or Replace IC605.

CROSS REFERENCE:

LSU (Laser Scanning Unit) SECTION ()

6.5.14. CIS (Contact Image Sensor) SECTION


Are the glass surface of the contact image sensor (CIS) and the white panel on the back of the operation block clean?
NG
Clean the location in question.
OK
Conduct a scanner test in service mode "555". (Refer to TEST FUNCTIONS.)
Is the LED lit?
NO
Is pin 6 of CN608 on the digital board at 0 V?
YES
Check the image senser.
YES
NO
Is pin 15 of IC605 on the digital board at 4 to 5 V?
NO
Check IC605 on the digital board.
YES
Check Q618,R748 on the digital board.
Is pin 3 of CN608 on the digital board at 4 to 5 V?
NO
Is pin 12 of IC605 on the digital board at 0 V?
YES
YES
NO
Check Q619, R729, R730 and R731 on the digital board.
Check IC605 on the digital board.
Observe the waveform at pin1 of CN608 on the digital board with an oscilloscope (while scanning the white panel).
NG
Check the image sensor.


Cycle time of scanning per line
Approx. 1.7 msec
Approx. 1V
(white level)
0V
Output time of scanning data of 1,728 dot.
Approx. 1 msec

CROSS REFERENCE:

TEST FUNCTIONS ()

6.5.15. HIGH VOLTAGE VALUE CHECK POINT

Measurement Procedure

1. Open the TOP cover.

2. Remove the developing unit, if it is equipped.

3. Open the TOP cover, and turn ON the TOP cover SW.

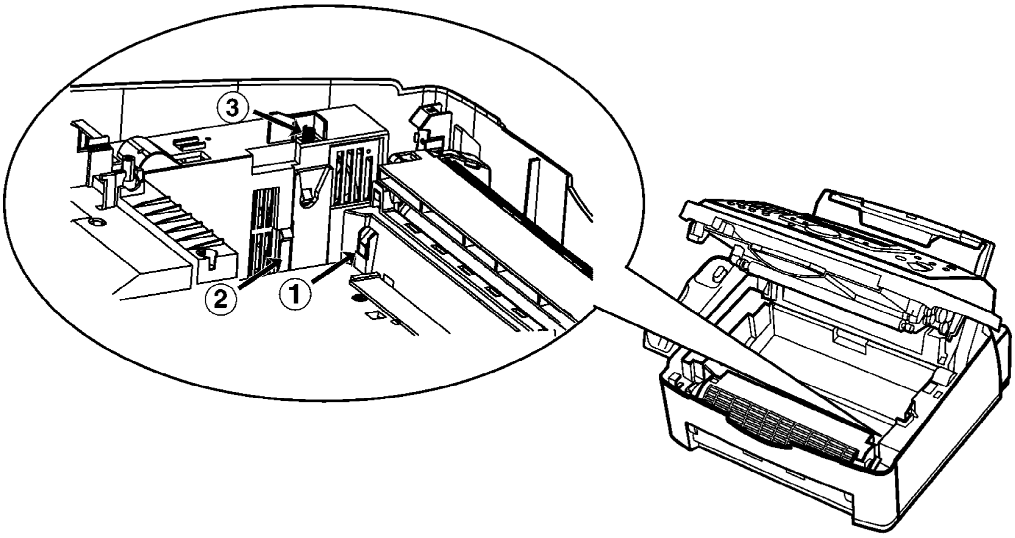
(Push the TOP cover SW with a sharp-tipped insulator or insert folded paper, etc. to the slit.)

4. The unit enters the service mode when the TOP cover is open, then push *628.
   (Don't push the START button.)
5. Touch the output terminals under test with the high voltage probes.
6. Push the START button.
   (This causes to output high voltage from each terminal, so be careful not to touch them. The sound “Pi Pi Pi” warns that the high voltage is outputting.)
7. When the measurement is finished, push the STOP button.
   (The high voltage output is stopped.)
8. Repeat the items No. 5~7 until the measurement is finished.
9. When the measurement is finished, turn OFF the TOP cover SW.

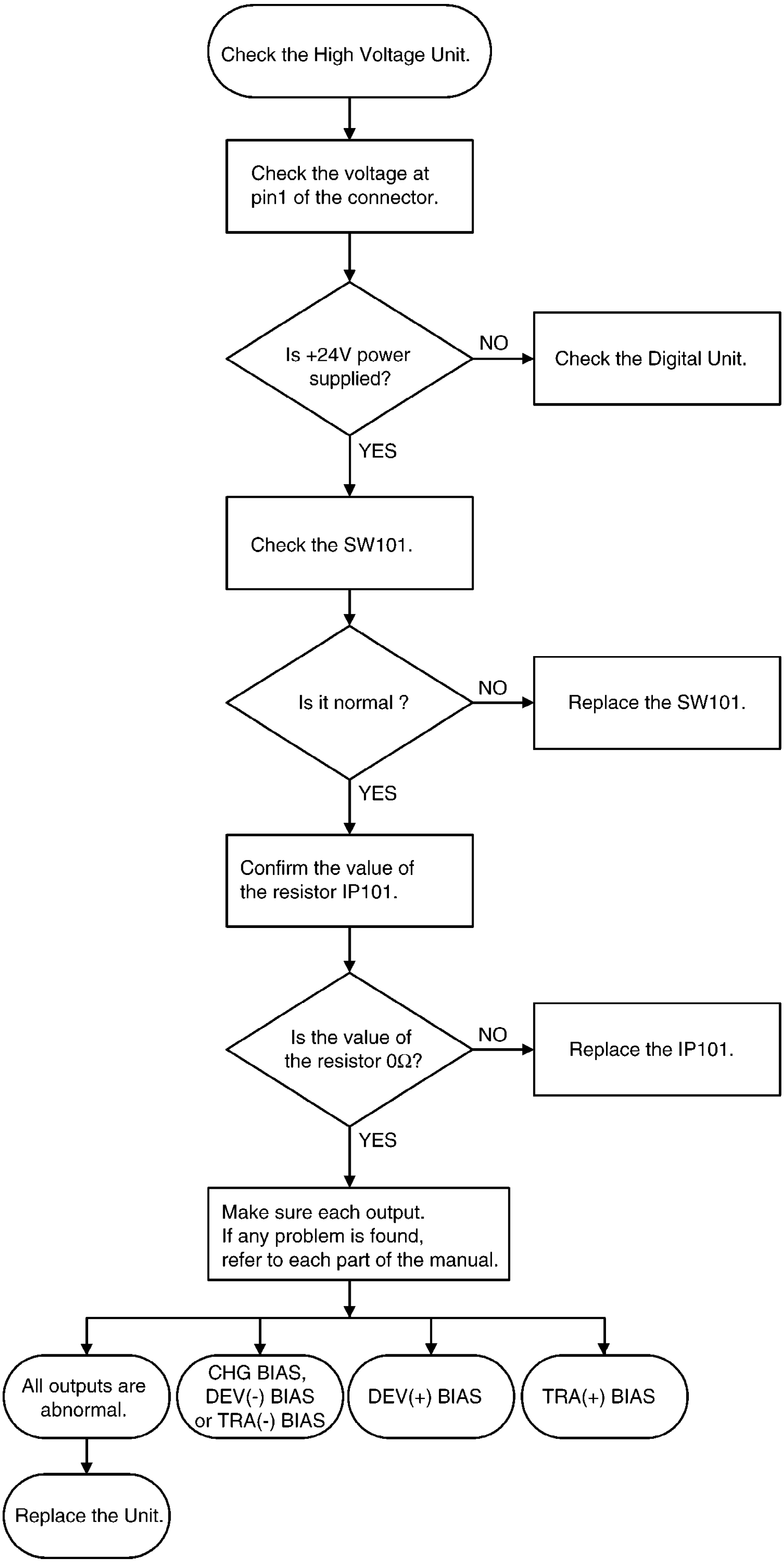
Output voltage of each terminal

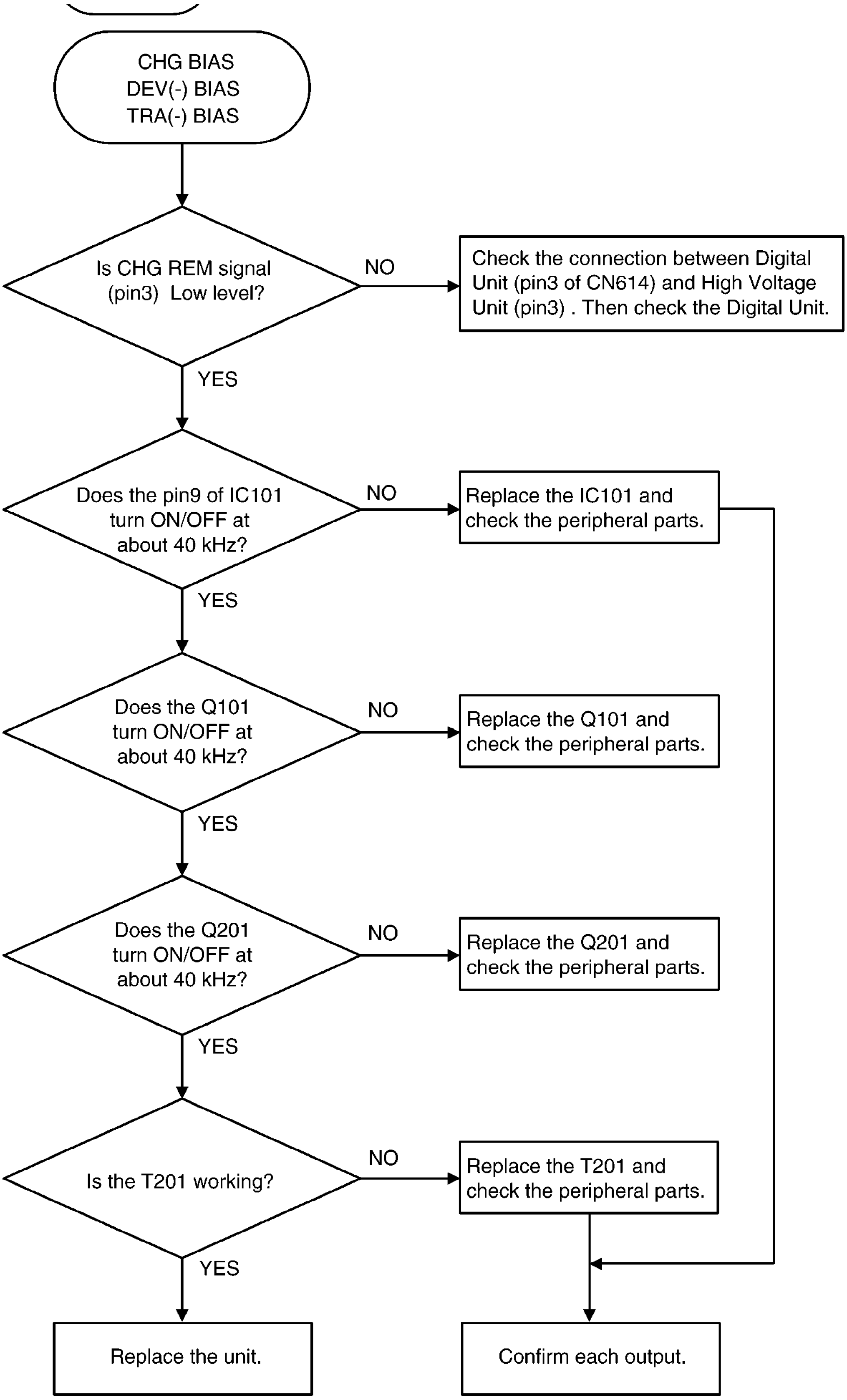
No.	BIAS Name	Specified output voltage	The range of specified output vo
①	CHG (Charge)	-1000V	-1000V± 30V
②	DEV (Developing)	-200V	-200V± 15V
③	TRA (Transfer)	-1000V	-1000V± 100V

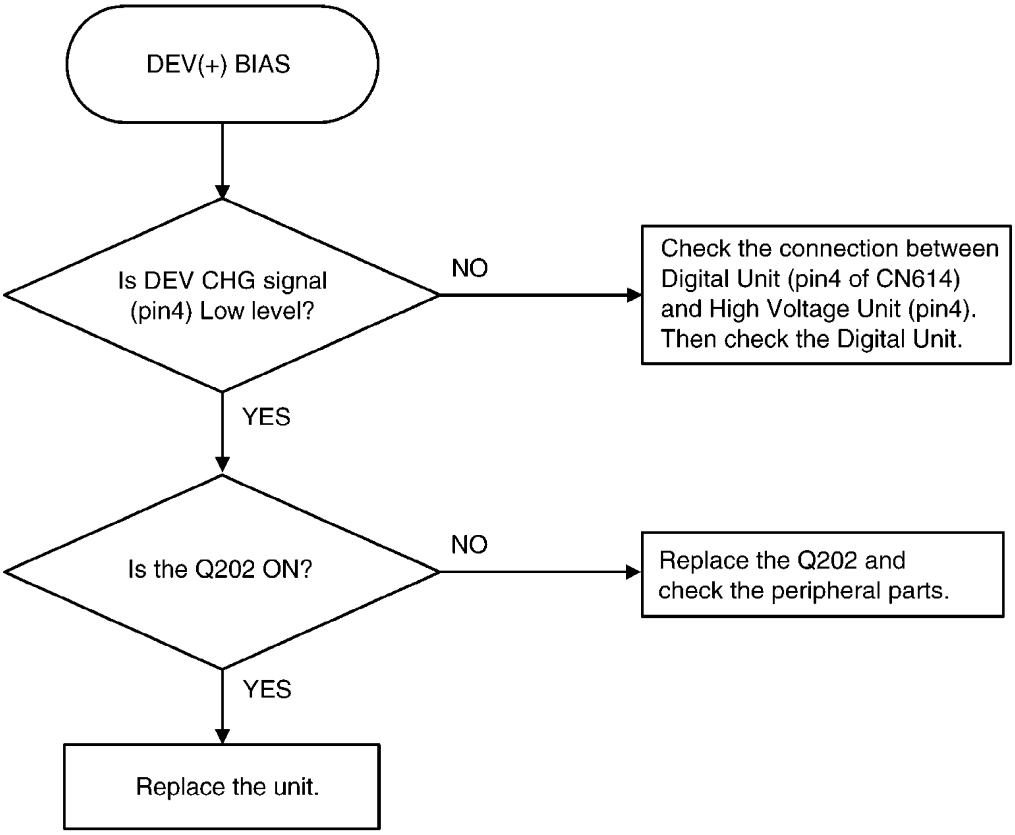
*** As for the High Voltage test equipment, FLUKE 85 (MULTI METER)+ HIOKI (HV PROBE 9014) or the equivalent should be used.**

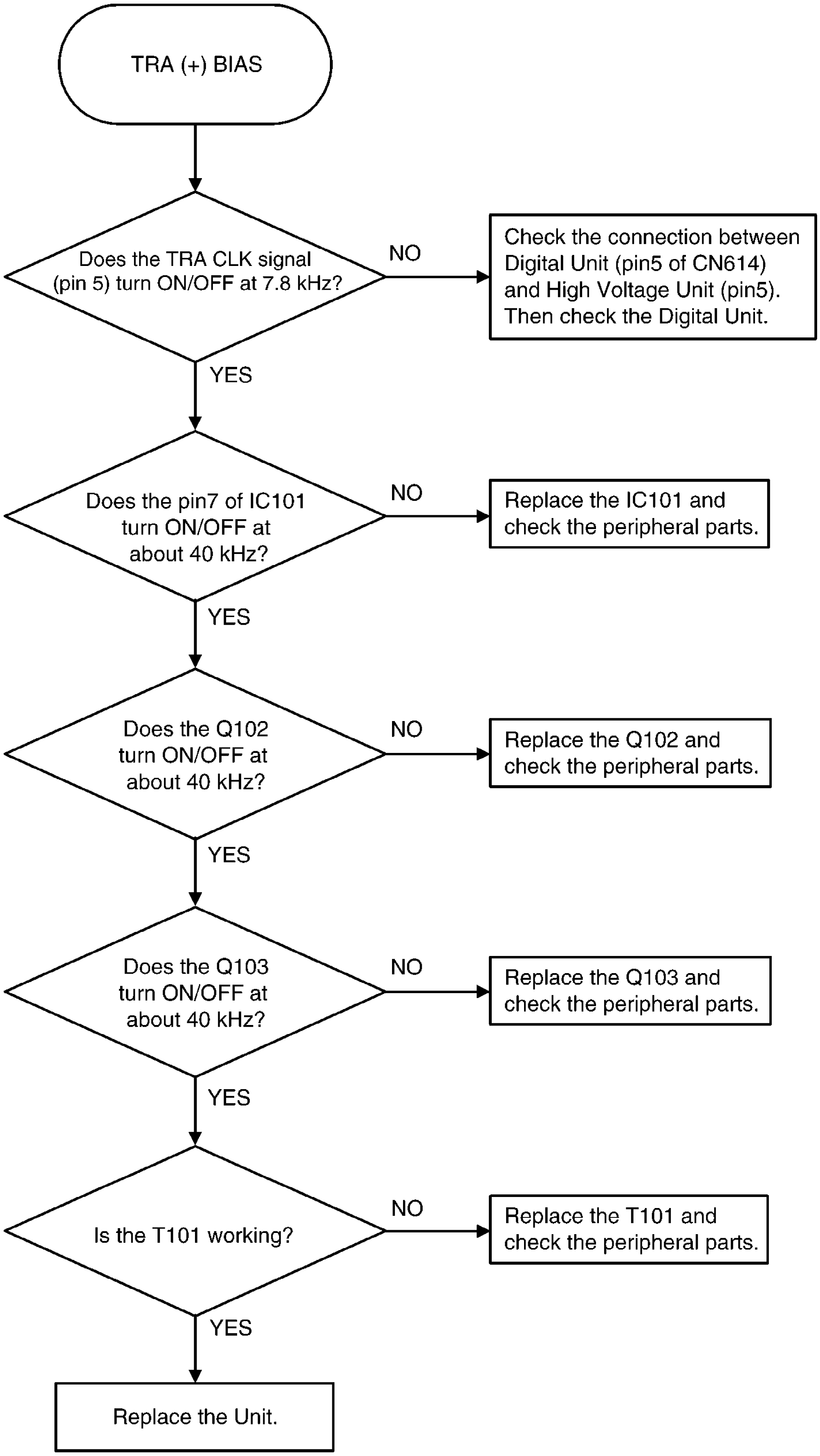


6.5.16. HIGH VOLTAGE SECTION


Check the High Voltage Unit.
Check the voltage at pin1 of the connector.
Is +24V power supplied?
NO
Check the Digital Unit.
YES
Check the SW101.
Is it normal ?
NO
Replace the SW101.
YES
Confirm the value of the resistor IP101.
Is the value of the resistor 0Ω?
NO
Replace the IP101.
YES
Make sure each output.
If any problem is found,
refer to each part of the manual.
All outputs are abnormal.
CHG BIAS, DEV(-) BIAS or TRA(-) BIAS
DEV(+) BIAS
TRA(+) BIAS
Replace the Unit.


CHG BIAS
DEV(-) BIAS
TRA(-) BIAS
Is CHG REM signal (pin3) Low level?
NO
Check the connection between Digital Unit (pin3 of CN614) and High Voltage Unit (pin3) . Then check the Digital Unit.
YES
Does the pin9 of IC101 turn ON/OFF at about 40 kHz?
NO
Replace the IC101 and check the peripheral parts.
YES
Does the Q101 turn ON/OFF at about 40 kHz?
NO
Replace the Q101 and check the peripheral parts.
YES
Does the Q201 turn ON/OFF at about 40 kHz?
NO
Replace the Q201 and check the peripheral parts.
YES
Is the T201 working?
NO
Replace the T201 and check the peripheral parts.
YES
Replace the unit.
Confirm each output.


DEV(+) BIAS
Is DEV CHG signal (pin4) Low level?
NO
Check the connection between Digital Unit (pin4 of CN614) and High Voltage Unit (pin4). Then check the Digital Unit.
YES
Is the Q202 ON?
NO
Replace the Q202 and check the peripheral parts.
YES
Replace the unit.


TRA (+) BIAS
Does the TRA CLK signal (pin 5) turn ON/OFF at 7.8 kHz?
NO
Check the connection between Digital Unit (pin5 of CN614) and High Voltage Unit (pin5). Then check the Digital Unit.
YES
Does the pin7 of IC101 turn ON/OFF at about 40 kHz?
NO
Replace the IC101 and check the peripheral parts.
YES
Does the Q102 turn ON/OFF at about 40 kHz?
NO
Replace the Q102 and check the peripheral parts.
YES
Does the Q103 turn ON/OFF at about 40 kHz?
NO
Replace the Q103 and check the peripheral parts.
YES
Is the T101 working?
NO
Replace the T101 and check the peripheral parts.
YES
Replace the Unit.

*** This Adjustment should be done with a single High Voltage Board.**

*** As for the High Voltage Probe, HV PROBE 9014 of HIOKI electric co. or the equivalent should be used.**

*** As for the tester, FLUKE 85 III multi meter or the equivalent should be used.**

*** Be careful not to touch the terminals during adjustment because the high voltage is used.**

6.5.17. POWER SUPPLY BOARD SECTION

6.5.17.1. KEY COMPONENTS FOR TROUBLESHOOTING

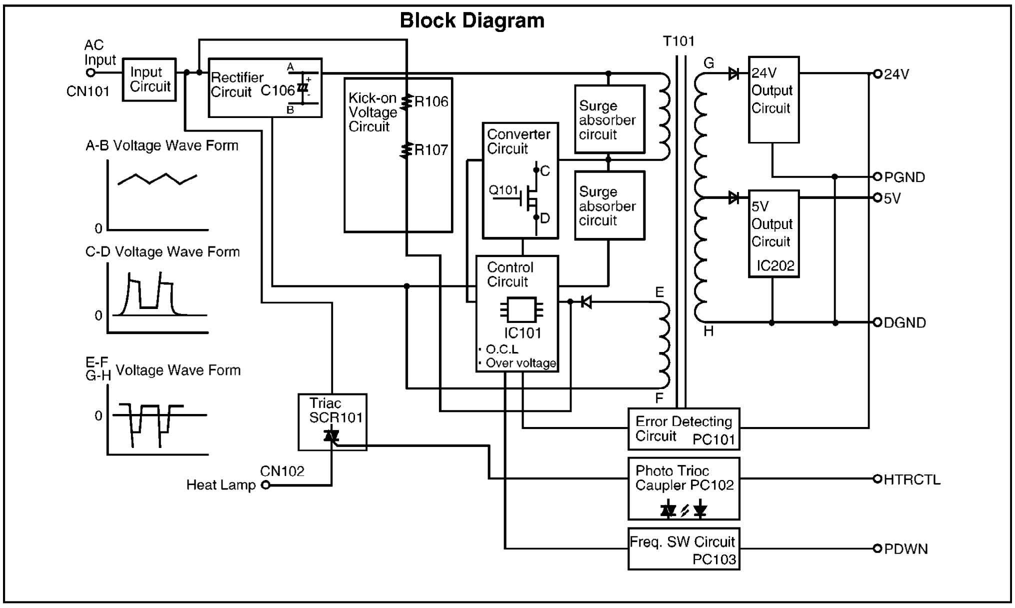
Check the following parts first: F101, D101-D104, C106, Q101, PC101 and IC101.

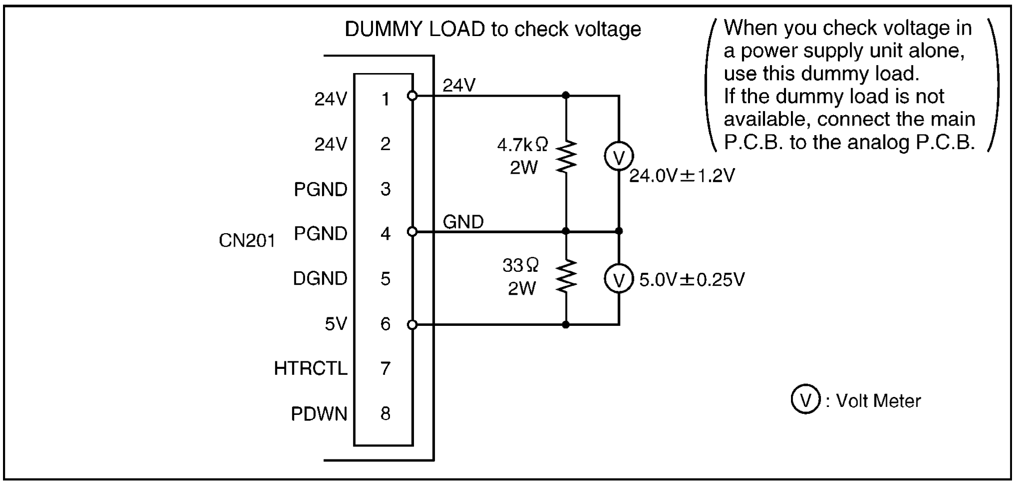
This comes from our experience with experimental tests. For example: power supply and lightning surge voltage test, withstanding voltage test, intentional short circuit test, etc.

Caution:

If you find a melted fuse in the unit, do not turn on the power until you locate and repair the faulty parts (except for the fuse); otherwise the fuse will melt again and you cannot pinpoint the faulty point.

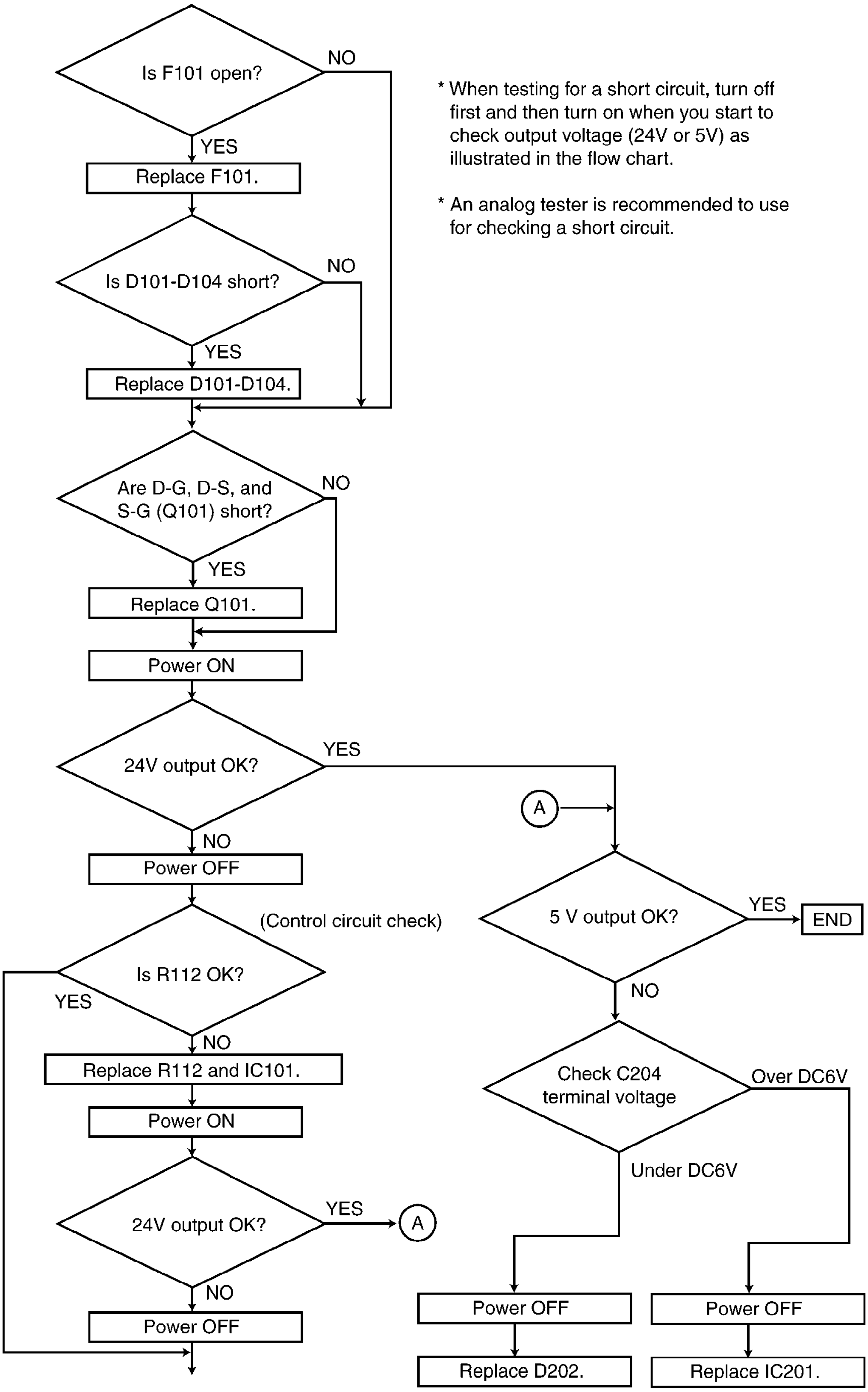
In most cases, the symptom is that nothing is output. It is more likely that the fault is in the primary side rather than the secondary side. Check the primary side first.


Block Diagram
AC Input
CN101
Input Circuit
Rectifier Circuit
C106
A
B
Kick-on Voltage Circuit
R106
R107
Converter Circuit
Q101
C
D
Surge absorber circuit
Surge absorber circuit
Control Circuit
IC101
· O.C.L
· Over voltage
T101
G
H
E
F
24V Output Circuit
5V Output Circuit
IC202
24V
PGND
5V
DGND
A-B Voltage Wave Form
C-D Voltage Wave Form
E-F G-H Voltage Wave Form
0
Triac SCR101
CN102
Heat Lamp
Error Detecting Circuit PC101
Photo Trioc Caupler PC102
Freq. SW Circuit PC103
HTRCTL
PDWN


DUMMY LOAD to check voltage
CN201
24V 1
24V 2
PGND 3
PGND 4
DGND 5
5V 6
HTRCTL 7
PDWN 8
24V
GND
4.7kΩ 2W
33Ω 2W
V
24.0V±1.2V
5.0V±0.25V
V : Volt Meter

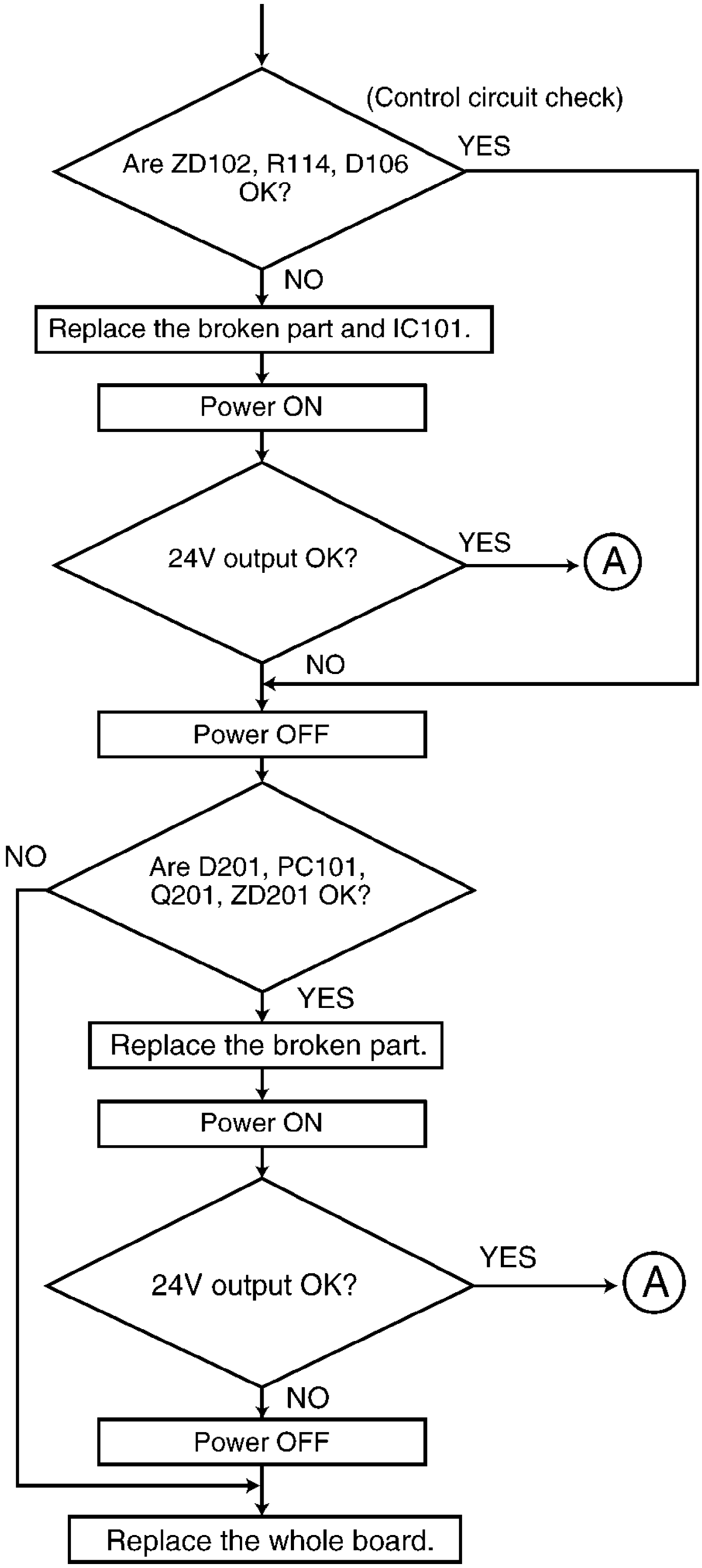
When you check voltage in a power supply unit alone, use this dummy load. If the dummy load is not available, connect the main P.C.B. to the analog P.C.B.

6.5.17.2. TROUBLESHOOTING FLOW CHART


Is F101 open?
NO
YES
Replace F101.
Is D101-D104 short?
NO
YES
Replace D101-D104.
Are D-G, D-S, and S-G (Q101) short?
NO
YES
Replace Q101.
Power ON
24V output OK?
YES
NO
Power OFF
(Control circuit check)
Is R112 OK?
YES
NO
Replace R112 and IC101.
Power ON
24V output OK?
YES
A
NO
Power OFF
A
5 V output OK?
YES
END
NO
Check C204 terminal voltage
Over DC6V
Under DC6V
Power OFF
Replace D202.
Power OFF
Replace IC201.

* When testing for a short circuit, turn off first and then turn on when you start to check output voltage (24V or 5V) as illustrated in the flow chart.

* An analog tester is recommended to use for checking a short circuit.


(Control circuit check)
Are ZD102, R114, D106 OK?
YES
NO
Replace the broken part and IC101.
Power ON
24V output OK?
YES
A
NO
Power OFF
Are D201, PC101, Q201, ZD201 OK?
NO
YES
Replace the broken part.
Power ON
24V output OK?
YES
A
NO
Power OFF
Replace the whole board.

6.5.17.3. BROKEN PARTS REPAIR DETAILS

(D101~D104)

Check for a short-circuit in terminal 4. If D101~D104 is short-circuit, F101 will melt (open).

In this case, replace all of the parts (D101~D104, F101).

(Q101)

The worst case of Q101 is a short-circuit between the Drain and Gate because damage expands to the peripheral circuit of Q101.

This is due to a very high voltage through the Gate circuit which is composed of R109 and IC101.

You should change all of the parts listed as follows.

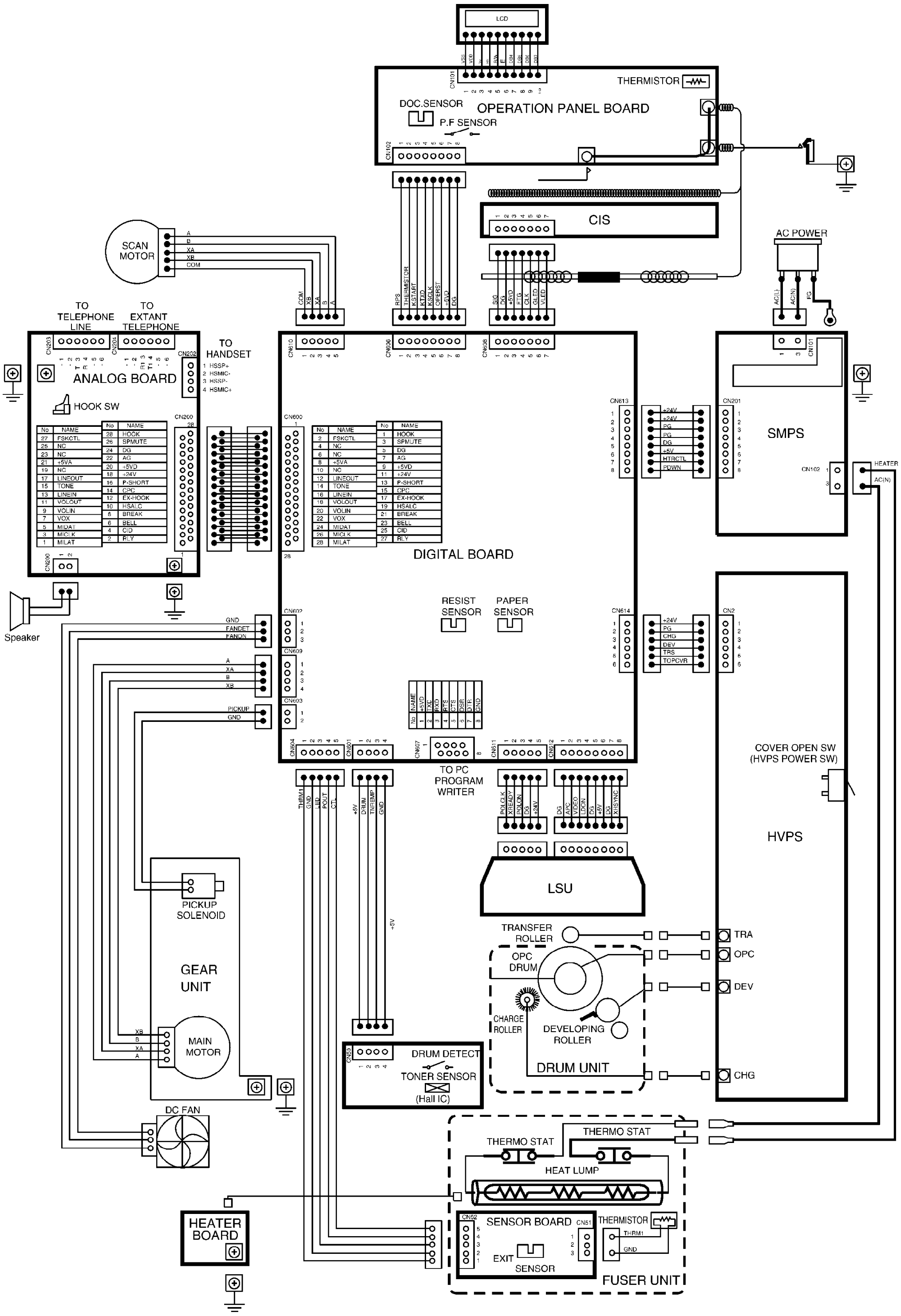
F101, Q101, R109, IC101

(D201)

If D201 is broken, the oscillation circuit in the power supply cannot operate. Check it with an electric tester.

7. CIRCUIT OPERATIONS

7.1. CONNECTION DIAGRAM


LCD
THERMISTOR
DOC.SENSOR
OPERATION PANEL BOARD
P.F SENSOR
CN101
CN102
CIS
AC POWER
SCAN MOTOR
A
B
XA
XB
COM
TO TELEPHONE LINE
TO EXTANT TELEPHONE
TO HANDSET
1 HSSP+
2 HSMIC-
3 HSSP-
4 HSMIC+
CN203
CN204
CN202
ANALOG BOARD
HOOK SW
CN200
CN205
CN610
CN606
CN608
CN600
CN613
CN201
SMPS
CN102
HEATER
AC(N)
DIGITAL BOARD
Speaker
RESIST SENSOR
PAPER SENSOR
CN602
CN609
CN603
CN614
CN2
GND
FANDET
FANON
PICKUP
CN604
CN601
CN607
CN611
CN612
TO PC PROGRAM WRITER
COVER OPEN SW (HVPS POWER SW)
HVPS
LSU
PICKUP SOLENOID
GEAR UNIT
MAIN MOTOR
TRANSFER ROLLER
OPC DRUM
CHARGE ROLLER
DEVELOPING ROLLER
DRUM UNIT
TRA
OPC
DEV
CHG
DRUM DETECT
TONER SENSOR
(Hall IC)
CN503
DC FAN
THERMO STAT
THERMO STAT
HEAT LUMP
HEATER BOARD
CN52
SENSOR BOARD
CN51
THERMISTOR
EXIT SENSOR
FUSER UNIT
+5V

7.2. GENERAL BLOCK DIAGRAM

The following is an outline of each device IC on the digital board.

1. ASIC (IC606)

This custom IC is used for general FAX operations.

(1)	CPU:	This model uses a Z80 equivalent CPU operating at 16MHz. Many of the peripheral functions are handled by custom designed LSIs. As a result, the CPU only needs to process the results.
(2)	RTC:	Real time clock.
(3)	DECODER:	Decords the address.
(4)	ROM/RAM I/F:	Controls the SELECT signal of ROM or RAM and bank switching.
(5)	LSU I/F:	Controls the polygon motor and outputs the VIDEO signal to LSU.
(6)	I/O PORT:	I/O Port Interface.
(7)	ANALOG UNIT:	Sends beep tones,etc. Convert the analog signal to the digital signal.
(8)	MOTOR I/F:	Controls the SCAN Motor.

2. G/A (IC605)

(1) OPERATION PANEL I/F: Serial interface with Operation Panel.
(2) ANALOG GATE ARRAY I/F: Controls the ANALOG GATE ARRAY.
(3) MOTOR I/F: Controls the ENGINE Motor.
(4) FAN I/F: Controls FAN MOTOR and detect the rotation of FAN MOTOR.
(5) SENSOR I/F: Controls the LED and detect the sensor signal.
(6) I/O PORT: I/O Port Interface.

3. ROM (IC607)

This 8MB FLASH ROM contains all of the program instructions on the unit operations.

4. Synchronous Dynamic RAM (IC604)

This SDRAM is used for CPU work and receiving memory and page memory.

5. MODEM (IC600)

Performs the modulation and the demodulation for FAX communication.
Detects the CALLER ID signal.

6. Read Section

CIS image sensor to read transmitted documents.

7. LSU (Laser Scanning Unit)

Forms the images on the OPC drum by rotating polygon motor and reflecting the laser beam against polygon.

8. Analog Board

Composed of ITS circuit and NCU circuit.

9. Sensor Section

Composed of 4 switches and 5 sensors.

10. Power Supply Board Switching Section

Supplies +5V and +24V to the unit and controls the HEATER.

11. High Voltage Power Supply Board Section

Supplies bias need for the printing operation: bias of the DRUM, Developing and Transcription.

12. Fixing Unit

Composed heat lamp, thermistor and thermal fuse.

7.3. FACSIMILE SECTION

7.3.1. DIGITAL SECTION

7.3.1.1. DIGITAL BLOCK DIAGRAM

7.3.1.2. ASIC (IC606)

This custom IC is used for general FAX operations.

(1)	CPU:	This model uses a Z80 equivalent CPU operating at 16MHz. Many of the peripheral functions are handled by custom designed LSIs. As a result,the CPU only needs to process the results.
(2)	RTC:	Real time clock.
(3)	DECORDER:	Decodes the address.
(4)	ROM/RAM I/F:	Controls the SELECT signal of ROM or RAM and bank switching.
(5)	LSU I/F:	Controls the polygon motor and outputs the VIDEO signal to LSU.
(6)	I/O PORT:	I/O Port Interface.
(7)	ANALOG UNIT:	Sends beep tones,etc. Convert the analog signal to the digital signal.
(8)	MOTOR I/F:	Controls the SCAN Motor.

7.3.1.3. ROM (IC607)

This 8MB FLASH ROM contains all of the program instructions on the unit operations.

7.3.1.4. GATE ARRAY (IC605)

(1) OPERATION PANEL I/F: Serial interface with Operation Panel.
(2) ANALOG GATE ARRAY I/F: Controls the ANALOG GATE ARRAY.
(3) MOTOR I/F: Controls the ENGINE Motor.
(4) FAN I/F: Controls FAN MOTOR and detect the rotation of FAN MOTOR.
(5) SENSOR I/F: Controls the LED and detect the sensor signal.
(6) I/O PORT: I/O Port Interface.

7.3.1.5. SYNCHRONOUS DYNAMIC RAM (IC604)

This SDRAM is used for CPU work and receiving memory and page memory.

7.3.1.6. MODEM(IC600)

Performs the modulation and the demodulation for FAX communication.
Detects the CALLER ID (DTMF) signal.

7.3.1.7. FSK RECEIVER (IC602)

Detects the CALLER ID (FSK) signal.

Description of Pin Distribution (IC606)

PIN No.	SIGNAL	I/O	POWER SUPPLIED VOLTAGE	EXPLANATION
1	VSS	GND	GND	GND
2	VDD3.3A	PWR	3.3V	POWER SOURCE
3	AIN1	AI	3.3V	IMAGE DATA FROM CIS
4	AIN2	AI	3.3V	THERMISTOR ON FUSE UNIT
5	AIN3	AI	3.3V	THERMISTOR ON OPE UNIT
6	AMON	AO	3.3V	NOT USED
7	VSS	GND	GND	GND
8	X32OUT	O	3.3VBATT	RTC(32.768KHz)
9	X32IN	I	3.3VBATT	RTC(32.768KHz)
10	3.3VBATIN	I	3.3VBATT	POWER SOURCE(+3.3V/LITHIUM BATTERY)
11	XBACKEN	I	3.3VBATT	BACKUP ENABLE(CONNECT TO RESET LINE)
12	RESCS2/CLKE/OP02	O	3.3VBATT	NOT USED
13	3.3VBATOUT	O	3.3VBATT	POWER SOURCE(+3.3V/LITHIUM BATTERY)
14	2.5VBATIN	I	2.5VBATT	POWER SOURCE(+2.5V/LITHIUM BATTERY)
15	XRESET	I	3.3V	RESET FOR INTERNAL CIRCUIT OF IC606
16	XORESET	O	3.3V	SYSTEM RESET OUTPUT
17	VSS	GND	GND	GND
18	VDD3.3V	PWR	3.3V	POWER SOURCE
19	XRESETI	I	3.3V	RESET INPUT
20	XWDERR	O	3.3V	WATCH DOG ERROR OUTPUT
21	TM0/IOP10	O	3.3V	TX MOTOR CONTROL
22	TM1/IOP11	O	3.3V	TX MOTOR CONTROL
23	TM2/IOP12	O	3.3V	TX MOTOR CONTROL
24	TM3/IOP13	O	3.3V	TX MOTOR CONTROL
25	TXE/IOP14	O	3.3V	TX MOTOR POWER CONTROL
26	VSS	GND	GND	GND
27	VDD2.5V	PWR	2.5V	POWER SOURCE
28	TRS/OP06	O	3.3V	TRANSFER BIAS CONTROL
29	HTRCTL	O	3.3V	HEATER CONTROL
30	POLCLK	O	3.3V	LSU CONTROL(POLYGON MOTOR CLOCK)

PIN No.	SIGNAL	I/O	POWER SUPPLIED VOLTAGE	EXPLANATION
31	POLON	O	3.3V	LSU CONTROL(POLYGON MOTOR)
32	XREADY	I	3.3V	LSU CONTROL
33	XHSYNC	I	3.3V	LSU CONTROL
34	LDON	O	3.3V	LSU CONTROL
35	APC	O	3.3V	LSU CONTROL
36	VIDEO	O	3.3V	LSU CONTROL(VIDEO SIGNAL)
37	XHSTRD/RBA[9]/ IP00	I	3.3V	NOT USED
38	XHSTWR/RBA[10]/ IP01	I	3.3V	NOT USED
39	RESINT	I	3.3V	INTERRUPT FROM IC605
40	XRESCS1	O	3.3V	CHIP SELECT FOR IC605
41	RESCLK	O	3.3V	CLOCK FOR IC605
42	VSS	GND	GND	GND
43	VDD2.5V	PWR	2.5V	POWER SOURCE
44	XOUT	O	3.3V	SYSTEM CLOCK(24MHz)
45	XIN	I	3.3V	SYSTEM CLOCK(24MHz)
46	VSS	GND	GND	GND
47	VDD3.3V	PWR	3.3V	POWER SOURCE
48	IOP07	O	3.3V	OUTPUT PORT(FLASH WRITE PROTECT)
49	XCHKCS/ÇnÇo03	O	3.3V	NOT USED
50	XROMCS	O	3.3V	ROM(IC607) CHIP SELECT
51	XRD	O	3.3V	CPU RD
52	XWR	O	3.3V	CPU WR
53	DB0	I/O	3.3V	DATA BUS 0
54	DB1	I/O	3.3V	DATA BUS 1
55	DB2	I/O	3.3V	DATA BUS 2
56	DB3	I/O	3.3V	DATA BUS 3
57	DB4	I/O	3.3V	DATA BUS 4
58	DB5	I/O	3.3V	DATA BUS 5
59	DB6	I/O	3.3V	DATA BUS 6
60	DB7	I/O	3.3V	DATA BUS 7
61	DB8	I/O	3.3V	DATA BUS 8
62	DB9	I/O	3.3V	DATA BUS 9
63	DB10	I/O	3.3V	DATA BUS 10
64	VSS	GND	GND	GND
65	VDD2.5V	PWR	2.5V	POWER SOURCE
66	DB11	I/O	3.3V	DATA BUS 11
67	DB12	I/O	3.3V	DATA BUS 12
68	DB13	I/O	3.3V	DATA BUS 13
69	DB14	I/O	3.3V	DATA BUS 14
70	DB15	I/O	3.3V	DATA BUS 15

PIN No.	SIGNAL	I/O	POWER SUPPLIED VOLTAGE	EXPLANATION
71	VDD5V	PWR	5V	POWER SOURCE
72	VSS	GND	GND	GND
73	VDD3.3V	PWR	3.3V	POWER SOURCE
74	SDCS	O	3.3V	SDRAM(IC604) CHIP SELECT
75	RAS	O	3.3V	SDRAM(IC604) ROW ADDRESS STROBE
76	CAS	O	3.3V	SDRAM(IC604) COLUMN ADDRESS STROBE
77	SDWE	O	3.3V	SDRAM(IC604) WR SIGNAL
78	SDDQMU	O	3.3V	SDRAM(IC604) CONTROL
79	SDDQML	O	3.3V	SDRAM(IC604) CONTROL
80	VSS	GND	GND	GND
81	SDCLK	O	3.3V	SDRAM(IC604) CLOCK
82	VSS	GND	GND	GND
83	VDD3.3V	PWR	3.3V	POWER SOURCE
84	ADR0	O	3.3V	ADDRESS BUS 0
85	ADR1	O	3.3V	ADDRESS BUS 1
86	ADR2	O	3.3V	ADDRESS BUS 2
87	ADR3	O	3.3V	ADDRESS BUS 3
88	ADR4	O	3.3V	ADDRESS BUS 4
89	ADR5	O	3.3V	ADDRESS BUS 5
90	ADR6	O	3.3V	ADDRESS BUS 6
91	ADR7	O	3.3V	ADDRESS BUS 7
92	ADR8	O	3.3V	ADDRESS BUS 8
93	ADR9	O	3.3V	ADDRESS BUS 9
94	ADR10	O	3.3V	ADDRESS BUS 10
95	ADR11	O	3.3V	ADDRESS BUS 11
96	ADR12	O	3.3V	ADDRESS BUS 12
97	VSS	GND	GND	GND
98	VDD2.5V	PWR	2.5V	POWER SOURCE
99	RBA0	O	3.3V	ROM/RAM BAKN ADDRESS BUS 0
100	RBA1	O	3.3V	ROM/RAM BAKN ADDRESS BUS 1
101	RBA2	O	3.3V	ROM/RAM BAKN ADDRESS BUS 2
102	RBA3	O	3.3V	ROM/RAM BAKN ADDRESS BUS 3
103	RBA4	O	3.3V	ROM/RAM BAKN ADDRESS BUS 4
104	RBA5	O	3.3V	ROM/RAM BAKN ADDRESS BUS 5
105	RBA6	O	3.3V	ROM/RAM BAKN ADDRESS BUS 6
106	RBA7/OP04	O	3.3V	NOT USED
107	RBA8/OP05	O	3.3V	NOT USED
108	VDD3.3V	PWR	3.3V	POWER SOURCE
109	VSS	GND	GND	GND
110	EVOLIN	AI	3.3V	NOT USED
111	EVOLOUT	AO	3.3V	NOT USED

PIN No.	SIGNAL	I/O	POWER SUPPLIED VOLTAGE	EXPLANATION
112	EVOLREF	AI	3.3V	NOT USED
113	TONE	AO	3.3V	TONE OUTPUT
114	XMDMCS	O	3.3V	MODEM(IC600) CHIP SELECT
115	XMDMINT	I	3.3V	MODEM(IC600) INTERRUPT
116	CPC/IOP27	O	3.3V	NOT USED
117	ADR13/IOP15	O	3.3V	NOT USED
118	ADR14/IOP16	O	3.3V	NOT USED
119	ADR15/IOP17	O	3.3V	NOT USED
120	XNMI/XINT	I	3.3V	NOT USED
121	TEST1	I	3.3V	NOT USED
122	TEST2	I	3.3V	NOT USED
123	TEST3	I	3.3V	NOT USED
124	TEST4	I	3.3V	NOT USED
125	VDD2.5V	PWR	2.5V	POWER SOURCE
126	VSS	GND	GND	GND
127	F1	O	3.3V	CLOCK FOR CIS
128	FTG	O	3.3V	STROBE FOR CIS
129	TXD/IOP20	O	3.3V	RS232C CONTROL(FOR SERVICE FUNCTION)
130	RXD/IOP21	I	3.3V	RS232C CONTROL(FOR SERVICE FUNCTION)
131	RTS/IOP22	O	3.3V	RS232C CONTROL(FOR SERVICE FUNCTION)
132	CTS/IOP23	I	3.3V	RS232C CONTROL(FOR SERVICE FUNCTION)
133	DSR/IOP24	I	3.3V	RS232C CONTROL(FOR SERVICE FUNCTION)
134	DTR/IOP25	O	3.3V	RS232C CONTROL(FOR SERVICE FUNCTION)
135	DCD/IOP26	O	3.3V	RESET FOR MODEM
136	ADSEL1	O	3.3V	CHANNEL SELECT FOR AIN
137	ADSEL2	O	3.3V	CHANNEL SELECT FOR AIN
138	VDD3.3V	PWR	3.3V	POWER SOURCE
139	VSS	GND	GND	GND
140	VDD2.5A	PWR	2.5V	POWER SOURCE
141	VREFB	AO	3.3V	STANDARD VOLTAGE FOR A/D
142	VCL	AO	3.3V	STANDARD VOLTAGE FOR A/D
143	VREFT	AO	3.3V	STANDARD VOLTAGE FOR A/D
144	VSSA	GND	GND	GND

Description of Pin Distribution (IC605)

PIN No.	SIGNAL	I/O	POWER SUPPLY VOLTAGE	EXPLANATION
1	VSS	0V	GND	GND
2	SENCTL2/IOP06	O	5V	NOT USED
3	SENCTL3/IOP07	I	5V	INPUT PORT(EX-HOOK)
4	SENIN0/IOP00	I	5V	INPUT FROM EXIT SENSOR
5	SENIN1/IOP01	I	5V	INPUT FROM REGIST SENSOR
6	SENIN2/IOP02	I	5V	INPUT PORT(BELL)
7	SENIN3/IOP03	I	5V	INPUT PORT(TNREMP)
8	IOP63/XCBUSY1	O	5V	NOT USED
9	IOP64/XCBUSY2	O	5V	NOT USED
10	IOP30(XHSYNC)	I	5V	INPUT PORT(XHSYNC)
11	IOP31	O	5V	NOT USED
12	IOP32	O	5V	OUTPUT PORT(CISON)
13	5V	5V	5V	POWER SOURCE
14	VSS	0V	GND	GND
15	IOP33	O	5V	OUTPUT PORT(CISLEDON)
16	IOP34	I	5V	INPUT PORT(DRUM)
17	IOP35	O	5V	OUTPUT PORT(PICKUP)
18	IOP36	O	5V	NOT USED
19	IOP37	O	5V	NOT USED
20	IOP40	O	5V	NOT USED
21	IOP41	O	5V	NOT USED
22	IOP42	O	5V	OUTPUT PORT(OPERST)
23	IOP43	O	5V	OUTPUT PORT(VOL0)
24	IOP44	O	5V	OUTPUT PORT(VOL1)
25	5V	5V	5V	POWER SOURCE
26	VSS	0V	GND	GND
27	MILAT/IOP10	O	5V	ANALOG ASIC CONTROL
28	MIDAT/IOP11	O	5V	ANALOG ASIC CONTROL
29	MICLK/IOP12	O	5V	ANALOG ASIC CONTROL
30	IOP45	O	5V	OUTPUT PORT(VOL2)
31	IOP46	O	5V	OUTPUT PORT(SPMUTE)
32	IOP47	O	5V	NOT USED
33	IOP50	I	5V	INPUT PORT(HOOK)
34	IOP51	O	5V	OUTPUT PORT(LEDCTL)
35	IOP52	I	5V	INPUT PORT(PAPER)
36	IOP53	O	5V	OUTPUT PORT(PDWN)
37	IOP54	I	5V	INPUT PORT(TOPCVR)
38	IOP55	O	5V	OUTPUT PORT(DEV)
39	IOP56	O	5V	OUTPUT PORT(CHG)
40	3.3V	3.3V	3.3V	POWER SOURCE
41	VSS	0V	GND	GND
42	DB0	I/O	3.3V	DATA BUS 0
43	DB1	I/O	3.3V	DATA BUS 1
44	DB2	I/O	3.3V	DATA BUS 2

PIN No.	SIGNAL	I/O	POWER SUPPLY VOLTAGE	EXPLANATION
45	DB3	I/O	3.3V	DATA BUS 3
46	DB4	I/O	3.3V	DATA BUS 4
47	DB5	I/O	3.3V	DATA BUS 5
48	DB6	I/O	3.3V	DATA BUS 6
49	DB7	I/O	3.3V	DATA BUS 7
50	3.3V	3.3V	3.3V	POWER SOURCE
51	VSS	0V	GND	GND
52	ADR0	I	3.3V	ADDRESS BUS 0
53	ADR1	I	3.3V	ADDRESS BUS 1
54	ADR2	I	3.3V	ADDRESS BUS 2
55	ADR3	I	3.3V	ADDRESS BUS 3
56	ADR4	I	3.3V	ADDRESS BUS 4
57	ADR5	I	3.3V	ADDRESS BUS 5
58	ADR6	I	3.3V	ADDRESS BUS 6
59	TEST0	I	5V	NOT USED
60	TEST1	I	5V	NOT USED
61	XWR	I	3.3V	WR SIGNAL
62	XRD	I	3.3V	RD SIGNAL
63	3.3V	3.3V	3.3V	POWER SOURCE
64	VSS	0V	GND	GND
65	CLK	I	3.3V	CLOCK INPUT
66	VSS	0V	GND	GND
67	XRESET	I	3.3V	RESET INPUT
68	XCS	I	3.3V	CHIP SELECT INPUT
69	INT	O	3.3V	INTERRUPT INPUT
70	KSTART	O	3.3V	OPERATION PANEL CONTROL
71	KLATCH/OP24/ SENCTL3	O	3.3V	NOT USED
72	KSCLK	O	3.3V	OPERATION PANEL CONTROL
73	KTXD	I/O	3.3V	OPERATION PANEL CONTROL
74	KRXD/IP23/SENIN3	I	3.3V	INPUT FROM READ POSITION SENSOR
75	3.3V	3.3V	3.3V	POWER SOURCE
76	VSS	0V	GND	GND
77	VIN0/IP20(APC)	I	3.3V	INPUT TO INVERTER
78	VIN1/IP21	I	3.3V	INPUT TO INVERTER
79	VIN2/IP22	I	3.3V	INPUT TO INVERTER
80	VOUT0/OP25	O	5V	OUTPUT FROM INVERTER
81	VOUT1/OP26	O	5V	OUTPUT FROM INVERTER
82	VOUT2/OP27	O	5V	OUTPUT FROM INVERTER
83	RM0	O	5V	RX MOTOR CONTROL
84	RM1	O	5V	RX MOTOR CONTROL
85	RM2	O	5V	RX MOTOR CONTROL
86	RM3	O	5V	RX MOTOR CONTROL

PIN No.	SIGNAL	I/O	POWER SUPPLY VOLTAGE	EXPLANATION
87	RXE	O	5V	NOT USED
88	5V	5V	5V	POWER SOURCE
89	VSS	0V	GND	GND
90	IOP57	O	5V	NOT USED
91	FANDET1/IOP14	I	5V	DETECT FAN ROTATION
92	FANON1/IOP15	O	5V	FAN CONTROL
93	FANDET2/IOP16	O	5V	OUTPUT PORT(BREAK)
94	FANON2/IOP17	O	5V	FAN CONTROL
95	IOP60/CSI	O	5V	NOT USED
96	IOP61/CCLK	O	5V	OUTPUT PORT(RLY)
97	IOP62/CSO	I	5V	INPUT PORT(VOX)
98	SENCTL0/IOP04	O	5V	LED CONTROL FOR EXIT SENSOR
99	SENCTL1/IOP05	O	5V	LED CONTROL FOR REGIST SENSOR
100	5V	5V	5V	POWER SOURCE

7.3.2. RTC BACKUP CIRCUIT

1. Function

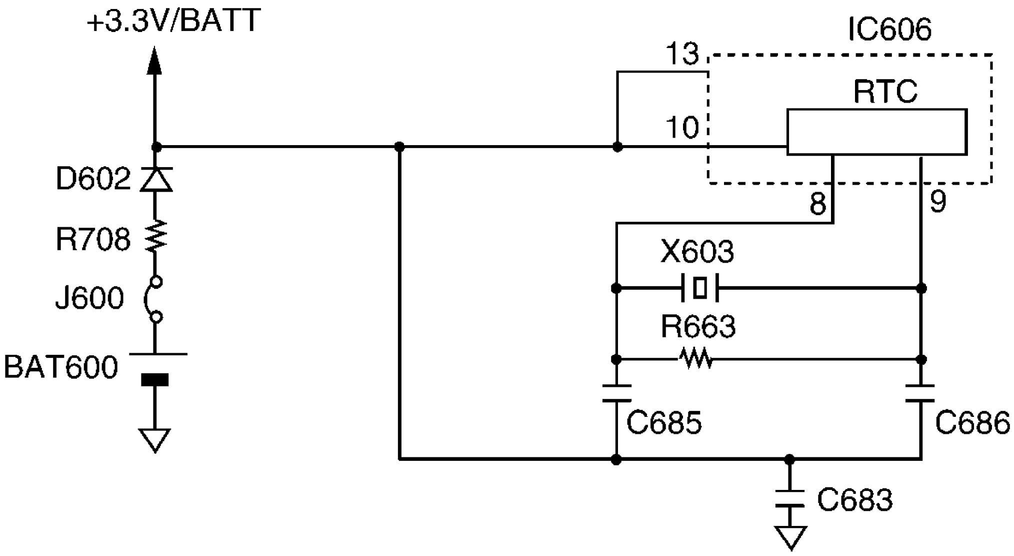
This unit has a lithium battery (BAT600) which works for the Real Time Clock IC (RTC: inside IC606).

The RTC continues to work, backed up by a lithium battery even when the power switch is OFF.

2. RTC Inside (IC606) Backup Circuit Operation

When the power switch is turned ON, power is supplied to the RTC (inside IC606). At this time, the voltage at pin 10 of the IC606 is +3.3V. When the power switch is turned OFF, the BAT600 supplies power to RTC through D602. The voltage at pin 10 of IC606 is about +2.5V. When the power switch is OFF and the voltage of +3.3V decreases, pin 10 of RTC (IC606) becomes roughly the same voltage as the battery voltage. RTC goes into the backup mode, in which the power consumption is lower.

Circuit Diagram



7.3.3. MODEM CIRCUIT OPERATION

The modem (IC600) has all the hardware satisfying the CCITT standards mentioned previously. When the ASIC IC606 (114) is brought to a low level, the modem (IC600) is chip-selected and the resistors inside IC are selected by the select signals from ASIC (IC606) ADR0-ADR4(pin 84~88). Commands are written through the data bus, and all processing is controlled by the ASIC (IC606) according to CCITT procedures. Here, the INT signal dispatched from IRQ (pin 108 of IC600) to the ASIC (IC606) implements post processing.

This modem (IC600) has an automatic application equalizer. With training signal 1 or 2 at the time of G3 reception, it can automatically establish the optimum equalizer. The modem (IC600) operates using the 32.256MHz clock (X600).

1. **Facsimile Transmission/DTMF Line Send**

   The digital image data on the data bus is modulated in the modem (IC600), and sent from pin 69 via modem IC600, Analog gate array IC207(24 → 22), amplifier IC204(6 → 7) and the NCU section to the telephone line.

   Refer to CHECK SHEET().

2. **Facsimile Reception**

   The analog image data which is received from the telephone line passes through the NCU section and enters pin 60 of the modem (IC600). The signals that enter pin 60 of the modem (IC600) are demodulated in the board to digital image signals, then placed on the data bus.

   In this case, the image signals from the telephone line are transmitted serially. Hence, they are placed on the bus in 8 bit units. Here, the internal equalizer circuit reduces the image

signals to a long-distance receiving level.
This is designed to correct the characteristics of the frequency band centered around 3 kHz and maintain a constant receiving sensitivity.
It can be set in the service mode.
Refer to CHECK SHEET().

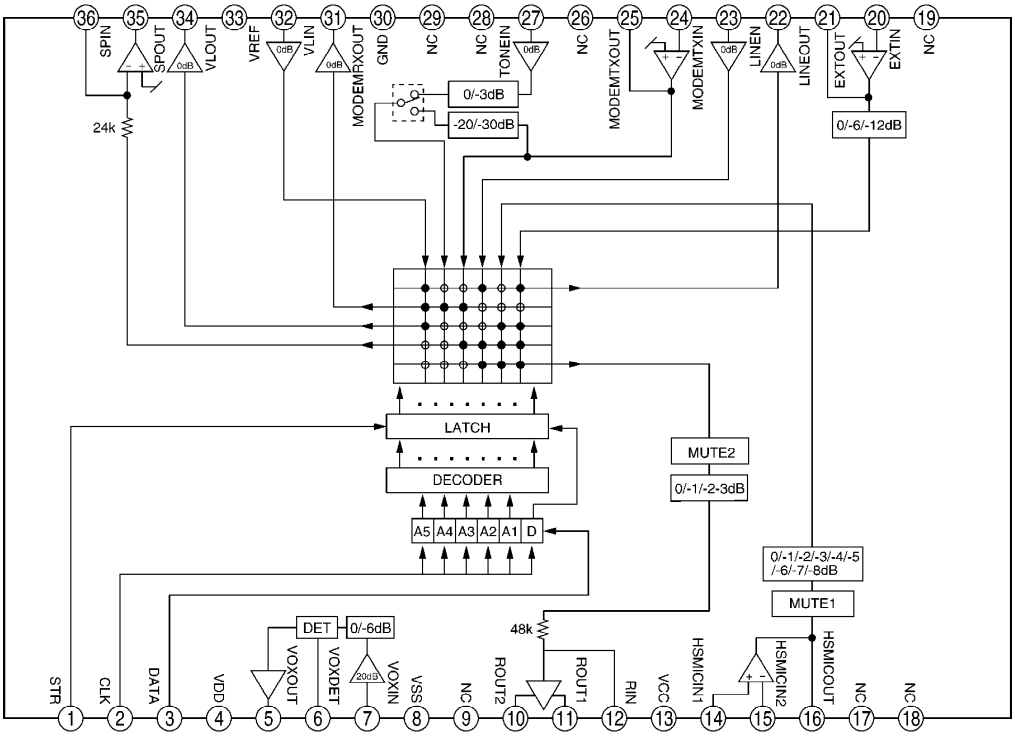
3. DTMF Transmission (Monitor tone)
   The DTMF signal generated in the modem (IC600) is output from pin 69, and the NCU section to the telephone line the same as facsimile transmission signals.
   (DTMF Monitor Tone)
   Refer to CHECK SHEET().
4. Busy/Dial Tone Detection
   The path is the same as FAX receiving. When it is detected, the carrier detect bit of the resistor in the modem (IC600) becomes 1, and this status is monitored by ASIC (IC606).
5. Call Tone Transmission
   This is the call signal which is generated the ASIC (IC606) and sent to the speaker.

7.3.4. ANALOG SECTION

Composed of ITS circuit and NCU circuit.

7.3.4.1. ANALOG GATE ARRAY (IC207)

The cross-point switch installed in this IC makes it possible to change the circuit configuration for any analog signals such as the fax signals sent from the digital board. In addition, this analog gate array integrates a handset circuit, input/output ports, etc.
This IC is controlled by ASIC(IC606) through GATE ARRAY (IC605) on the digital board.


36 SPIN
35 SPOUT
34 VLOUT
33
32 VREF
31 VLIN
30 MODEMRXOUT
29 GND
28 NC
27 NC
26 TONEIN
25 NC
24 MODEMTXOUT
23 MODEMTXIN
22 LINEIN
21 LINEOUT
20 EXTOUT
19 EXTIN
NC
0dB
0/-3dB
-20/-30dB
0/-6/-12dB
24k
LATCH
DECODER
A5 A4 A3 A2 A1 D
MUTE2
0/-1/-2-3dB
0/-1/-2/-3/-4/-5 /-6/-7/-8dB
MUTE1
DET
0/-6dB
20dB
48k
1 STR
2 CLK
3 DATA
4 VDD
5 VOXOUT
6 VOXDET
7 VOXIN
8 VSS
9 NC
10 ROUT2
11 ROUT1
12 RIN
13 VCC
14 HSMICIN1
15 HSMICIN2
16 HSMICOUT
17 NC
18 NC

Explanation of ANALOG GATE ARRAY (IC207 on the ANALOG Board)

No.	Name	Function	No.	Name	Function
1	STR	Strobe input	19	NC	Not used
2	CLOCK	Clock input	20	EXTIN	Ext amp output
3	DATA	Data input	21	EXTOUT	Ext amp input
4	VDD	Logic power supply	22	LINEOUT	Line amp output
5	VOXOUT	VOX output	23	LINEIN	Line amp input
6	VOXDET	VOX detection adjustment	24	MODEMTXIN	MODEM TX amp input
7	VOXIN	VOX input	25	MODEMTXOUT	MODEM TX amp output
8	VSS	Logic ground	26	NC	Not used
9	NC	Not used	27	TONEIN	Tone amp input
10	ROUT2	HS receiver amp output 2	28	NC	Not used
11	ROUT1	HS receiver amp output 1	29	NC	Not used
12	RIN	HS receiver amp input	30	GND	Analog ground
13	VCC	Analog ground	31	MODEMRXOUT	MODEM RX amp output
14	HSMICIN1	HS mic amp input 1	32	VLIN	Volume amp input
15	HSMICIN2	HS mic amp input 2	33	VREF	Reference voltage output
16	HSMICOUT	HS mic amp output	34	VLOUT	Volume amp output
17	NC	Not used	35	SPOUT	Speaker amp output
18	NC	Not used	36	SPIN	Speaker amp input

7.3.4.2. DESCRIPTION OF BLOCK DIAGRAM IN ANALOG SECTION

1. Function

The analog section works as an interface between the telephone line.
The analog ASIC (IC207) on the analog board exchanges FAX TX and RX signals between the MODEM (IC600) and the analog section.
The control signals transmitted to the analog section are output mainly from G/A IC605, and the analog status is stored as data in G/A IC605.

2. Circuit Operation
[NCU]: Network Control Unit the NCU comprises of the following; DC loop forming circuit to connect with the telephone line; Switching circuit for other interconnected telephones; Bell detection circuit; Side tone circuit; Remote fax activation circuit. Refer to NCU SECTION () for the details.

7.3.4.3. BLOCK DIAGRAM

7.4. NCU SECTION

7.4.1. GENERAL

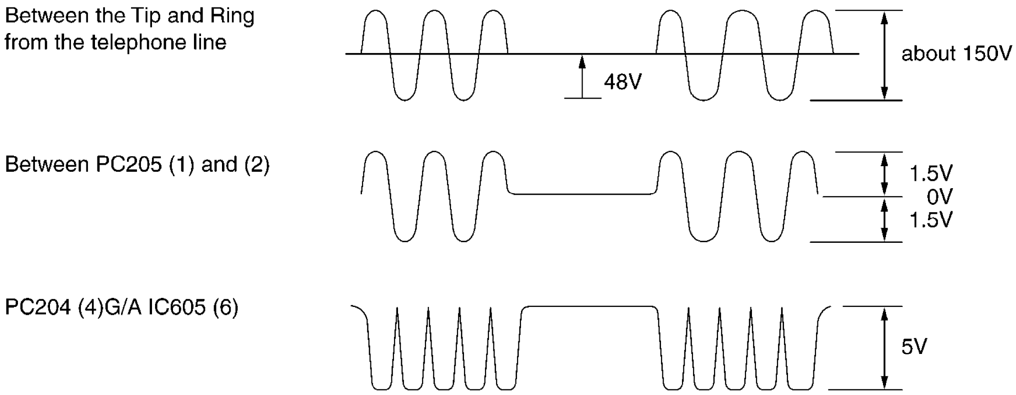
This section is the interface between the telephone line and external telephone. It is composed of an EXT. TEL line relay (RLY200), bell detection circuit, TAM interface circuit, line amplifier and side tone circuits and a multiplexer.

7.4.2. EXT. TEL. LINE RELAY (RLY200)

1. Circuit Operation
Normally, this relay switches to the external telephone side (break) and switches to the open side (make) while OFF-HOOK.
{ IC605 (95) High Level → CN600 (27) High Level} → CN201 (2) High Level → Q212 ON → RLY200 (ON) → (make)
{ IC605 (93) LOW Level → CN600 (21) LOW Level} → CN201 (8) LOW Level → PC204 ON → Q211 (ON) → (make)

7.4.3. BELL DETECTION CIRCUIT

1. Circuit Operation
The signal waveform for each point is indicated below. The signal (low level section) input to pin 6 of gate array IC605 on the digital board is read by ASIC and judged as a bell.
TEL LINE → PC205 (1, 2 - 4) → IC605 (6)


Between the Tip and Ring from the telephone line
48V
about 150V
Between PC205 (1) and (2)
1.5V
0V
1.5V
PC204 (4)G/A IC605 (6)
5V

7.4.4. CALLING LINE IDENTIFICATION CIRCUIT

1. **Function**

   This unit is compatible with the Caller ID service offered by your local telephone company. To use this feature, you must subscribe to a Caller ID service. The data for the caller ID from the telephone exchange is sent during the interval between the first and second rings of the bell signal. The data from the telephone exchange is a modem signal which is modulated in an FSK (Frequency Shift Keying) format. Data “0” is a 1200 Hz sine wave, and data 1 a 2200 Hz sine wave.

   There are two type of the message format which can be received: i.e.the single data message format and multiple data message format.

   The multiple data format allows to transmit the name and data code information in addition to the time and telephone number data.

   When there is multiple data in the unit, the name or telephone number are displayed.

2. **Circuit Operation**

   FSK signal of the caller ID signal input from TEL LINE is processed with FSK receiver (IC602).

   Refer to CHECK SHEET () for the route of caller ID signal.

7.4.5. LINE AMPLIFIER AND SIDE TONE CIRCUIT

1. **Circuit Operation**

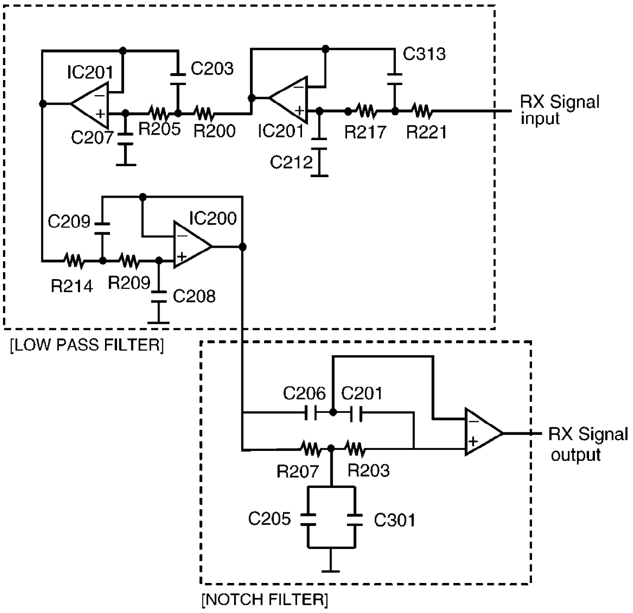
   The reception signal output from the line transformer T201 is input to pin (2) of IC204 via C232, R236 and then the signal is amplified at pin (1) of IC204 and sent to the reception system.

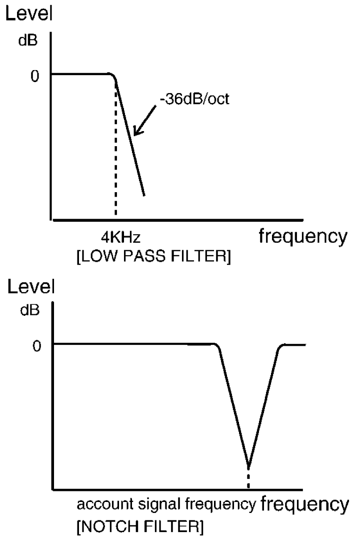
The transmission signal goes through C224, R232 and enters IC204-pin (6), where the signal is amplified. Then, it is output from pin (7) of IC204 and transmitted to T201 via L230, C237, R244, R243. Without a side tone circuit, the transmission signal will return to the reception amplifier via R236, C232. When the side tone circuit is active, the signal output from IC204 pin (7) passes through L230, C237, R241, R233, C233, C225, C223, and R229 and goes into the amplifier IC204 pin (3). This circuit is used to cancel the transmission return signal.
The TX signal is output to the circuit analog the route from the IC204 7 pin → L230 → C237 → R244 → R243 → T201 → TEL LINE.
However, if balance is lost in the bridge, a voltage occurs between the IC207 6 pin and 5 pin and a side tone results, because the balance cannot be maintained completely at all frequencies in the audio range some side tone always occur.

7.4.6. LOW PASS FILTER AND NOTCH FILTER

1. Function
This low pass filter and notch filter attenuates the account signal from the commutator to eliminate influence on the conversation and communication.

2. Circuit Operation
This low pass filter is an eight-order active filter, and the cutoff frequency is approximately 4 kHz.
NOTCH FILTER has filter pole of account signal frequency.


IC201
C203
C313
RX Signal input
C207
R205
R200
IC201
R217
R221
C212
C209
IC200
R214
R209
C208
[LOW PASS FILTER]
C206
C201
RX Signal output
R207
R203
C205
C301
[NOTCH FILTER]



7.4.7. REMOTE FAX ACTIVATION CIRCUIT

1. Function

   Another telephone connected to same line activates the unit to the FAX mode by using a DTMF signal.

2. Signal Path

   Refer to CHECK SHEET ().

7.4.8. TAM INTERFACE CIRCUIT

This circuit is to switch between FAX receiving and the external TAM's message recording automatically. This circuit consists of the monitor,transformer and amplifier.
For details, please refer to TAM INTERFACE SECTION ().

7.5. ITS (Integrated telephone System) and MONITOR SECTION

7.5.1. GENERAL

The general ITS operation is performed by the special IC207 which has a handset circuit. The alarm tone, the key tone, and the beep are output from the ASIC IC606 (digital board).

7.5.1.1. TELEPHONE MONITOR

1. Function

   This is the function when you are not holding the handset and can hear the caller's voice from the line.

2. Circuit Operation

   (Telephone Monitor Signal Path)

   Signals received from the telephone line are output through at the speaker via the following path.

3. Signal Path

Refer to CHECK SHEET.

7.5.1.2. HANDSET CIRCUIT

1. Function

This circuit controls the conversation over the handset, i.e. the transmitted and received voices to and from the handset.

2. Signal Path (Transmission signal)

Refer to CHECK SHEET.

3. Signal path (Reception signal)

Refer to CHECK SHEET.

7.5.1.3. MONITOR CIRCUIT

1. Function

This circuit monitors various tones, such as (1) DTMF tone, (2) Alarm/Beep/Key tone/Bell.

2. Signal Path

A. DTMF MONITOR

(Speaker Operation)

Refer to CHECK SHEET.

(Handset Operation)

Refer to CHECK SHEET.

B. ALARM/BEEP/KEY TONE/BELL

Refer to CHECK SHEET.

7.5.1.4. TAM INTERFACE SECTION

1. Function

When TAM is connected to this unit, the unit receives documents for FAX calls or the external TAM records a voice message automatically.

2. Circuit Operation

The TAM INTERFACE circuit consists of the transformer (T202), amplifier (IC202), analog ASIC (IC207), MODEM (IC600) on the digital board to detect the other party CNG signal, and RLY200 to separate EXT.TAM.

A. CNG signal detection circuit

The CNG signal from the other party’s FAX is detected in

MODEM IC600 (digital board).
(Signal path)
Refer to CHECK SHEET().

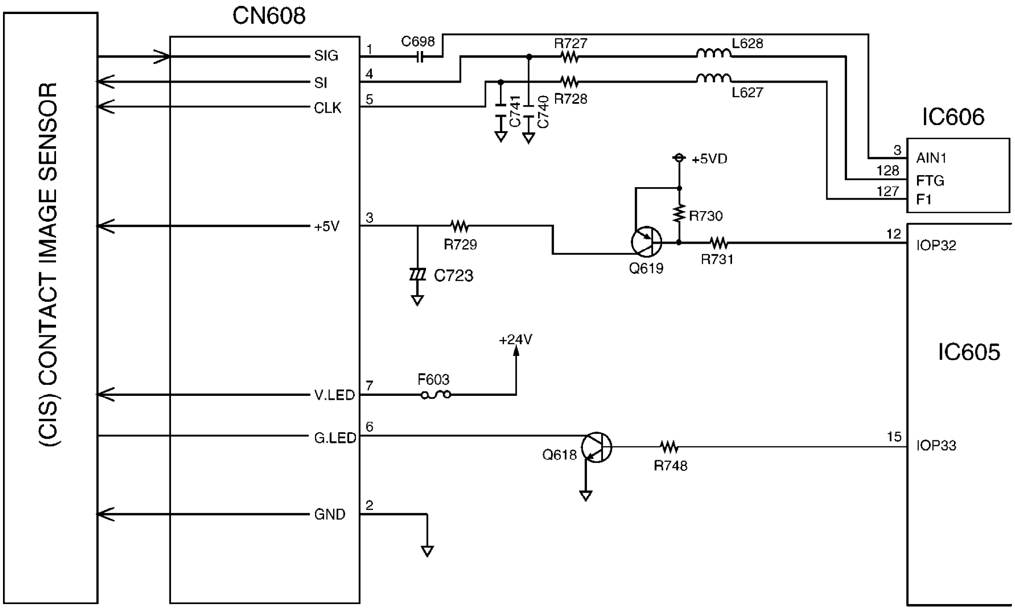
B. Remote receiving

This is the parallel-connected DTMF signal for the TEL or EXT.TEL mode between T and R. When the other party is a FAX, the unit switches to FAX receiving.
(Signal Path)
Refer to CHECK SHEET().

7.6. CIS CONTROL SECTION

The scanning block of this device consists of a control circuit and a contact image sensor made up of a celfoc lens array, an LED, a light guide, and photoelectric conversion elements.

Circuit Diagram


CN608
(CIS) CONTACT IMAGE SENSOR
SIG
SI
CLK
+5V
V.LED
G.LED
GND
1
4
5
3
7
6
2
C698
R727
L628
R728
L627
C741
C740
IC606
3
128
127
AIN1
FTG
F1
+5VD
R730
R731
Q619
12
IOP32
R729
C723
+24V
F603
IC605
Q618
R748
15
IOP33

When an original document is inserted and the start button pressed, pin 15 of IC605 goes to a high level and the transistor Q618 turns on.This applies voltage to the LED to light it. The contact image sensor is driven by each of the FTG-F1 signals output from IC606, and the original image illuminated by the LED undergoes photoelectric conversion to output an analog image signal (SIG). The analog image signal is input to the system ASIC on AIN1 (pin 3 of IC606) and converted into 8-bit data by the A/D converter inside IC606. Then this signal undergoes digital processing in order to obtain a high-quality image.

7.7. STEPPING MOTOR DRIVE SECTION

7.7.1. ENGINE MOTOR DRIVE CIRCUIT

1. Functions

This motor functions for main operations FAX reception and copy printing.

This feed recording paper synchronized for printing.

2. Motor operation

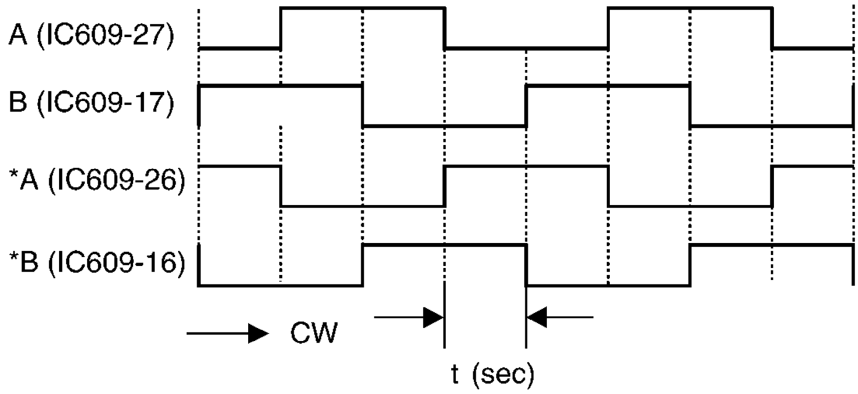
Excitation pulses is output from G/A (IC605) pins 83, 84, 85 and 86. Then stepping pulses are output from driver IC (IC609) pin No 2, 7, 8 and 13, and drives the motor coil.

During motor driving, pin 90 of G/A IC605 becomes a low level.

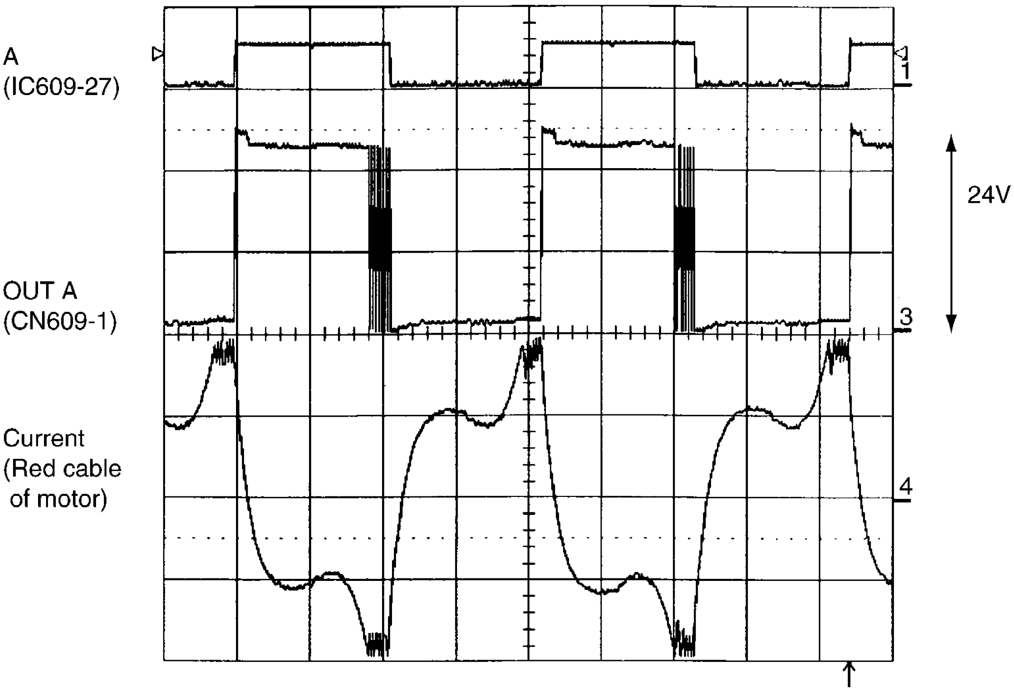
As a result, a current of about 1A are supplied to the motor coil.

7.7.1.1. TIMING CHART

① 2 phase excitation



② 2 phase excitation output waveform (example "A Phase")

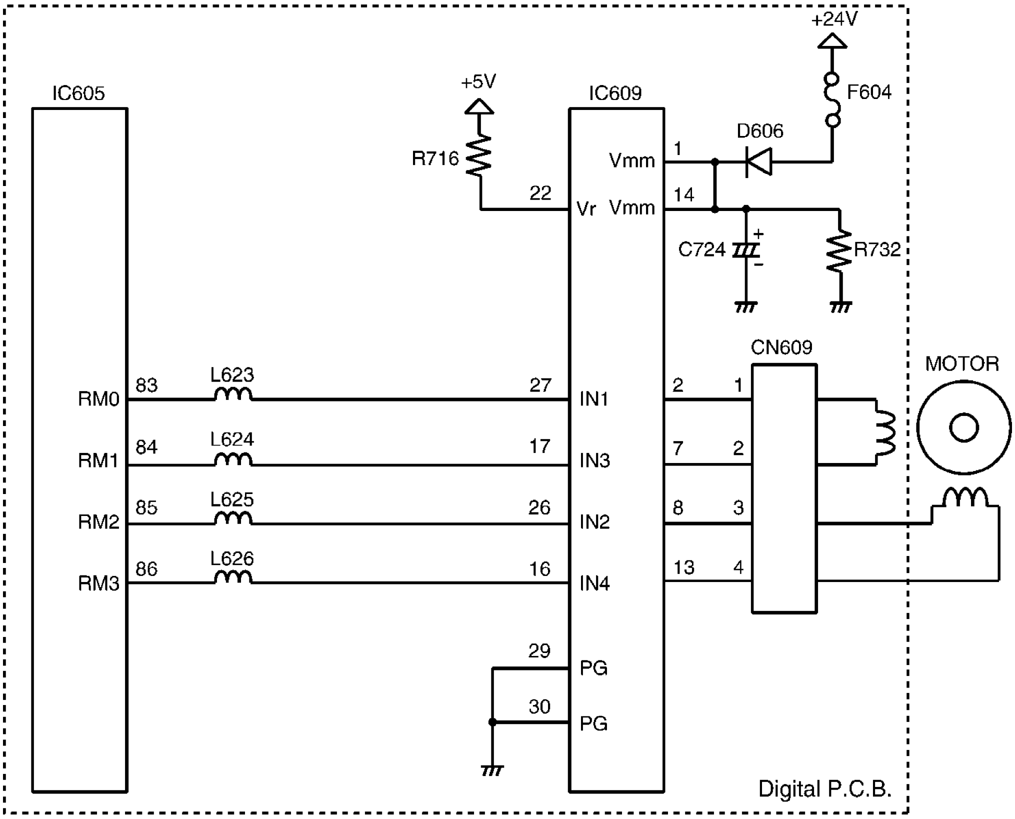


Other phase (B, *A, *B) operates as A phase does.

DRIVE MODE

FUNCTION	MODE	PHASE PATTERN	SPEED	CURREN
PRINT	-	2 phase	951pps	1A

7.7.1.2. ENGINE MOTOR DRIVE CIRCUIT


+24V
IC605
+5V
IC609
F604
D606
R716
Vmm
1
22
Vr Vmm
14
C724
R732
CN609
MOTOR
RM0
83
L623
27
IN1
2
1
RM1
84
L624
17
IN3
7
2
RM2
85
L625
26
IN2
8
3
RM3
86
L626
16
IN4
13
4
29
PG
30
PG
Digital P.C.B.

7.7.2. SCAN MOTOR DRIVE CIRCUIT

1. Functions

This motor functions for main operations including FAX transmission.
This feed document paper synchronized for reading.

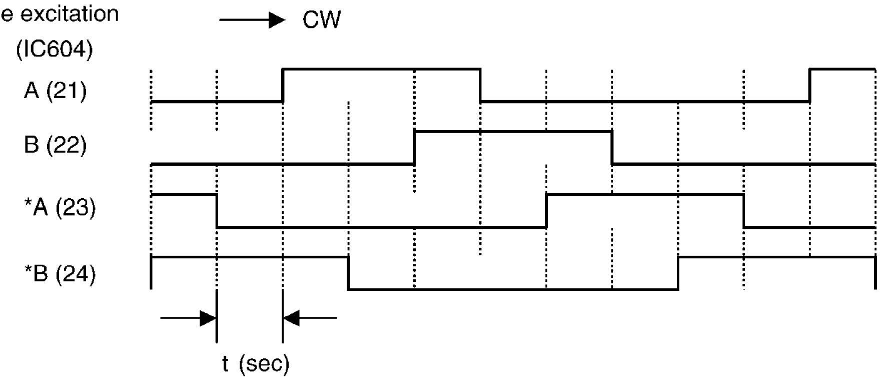
2. Motor operation

During motor driving, pin 25 of ASIC IC606 becomes a high level, and Q613, Q620 turns ON.
As a result, +24V is supplied to the motor coil.
Stepping pulses are output from ASIC IC606 pins, 21, 22, 23, 24, causing driver IC610 pins,
16 ~ 13 to drive the motor coil.

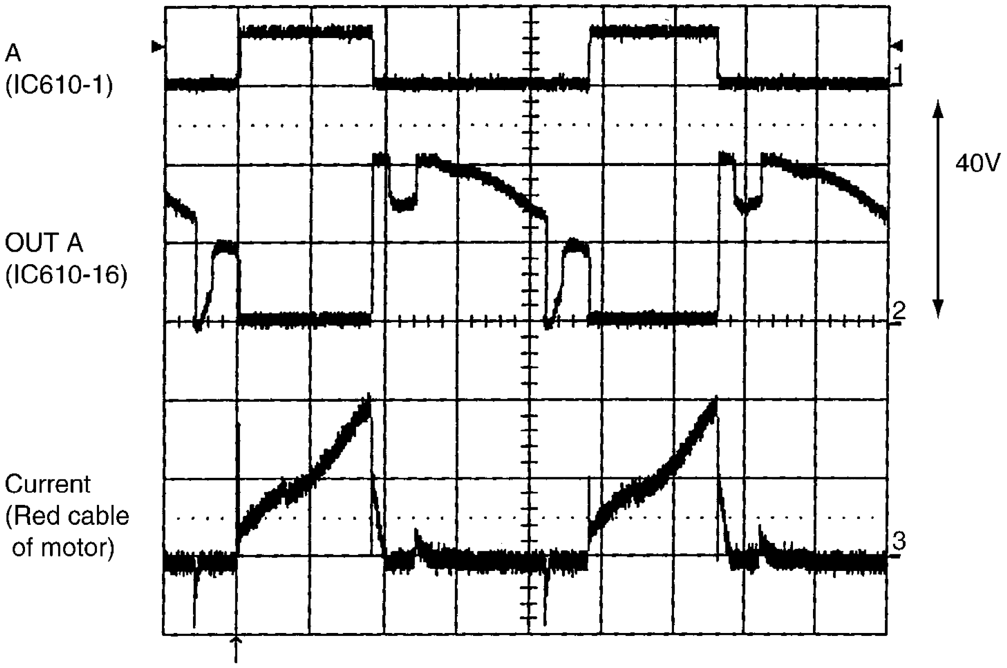
The motor coil is energized sequentially in 2 phase increments, which causes a 1-step rotation.
A 1-step rotation feeds 0.065mm of document paper.

7.7.2.1. TIMING CHART

① 1-2 phase excitation

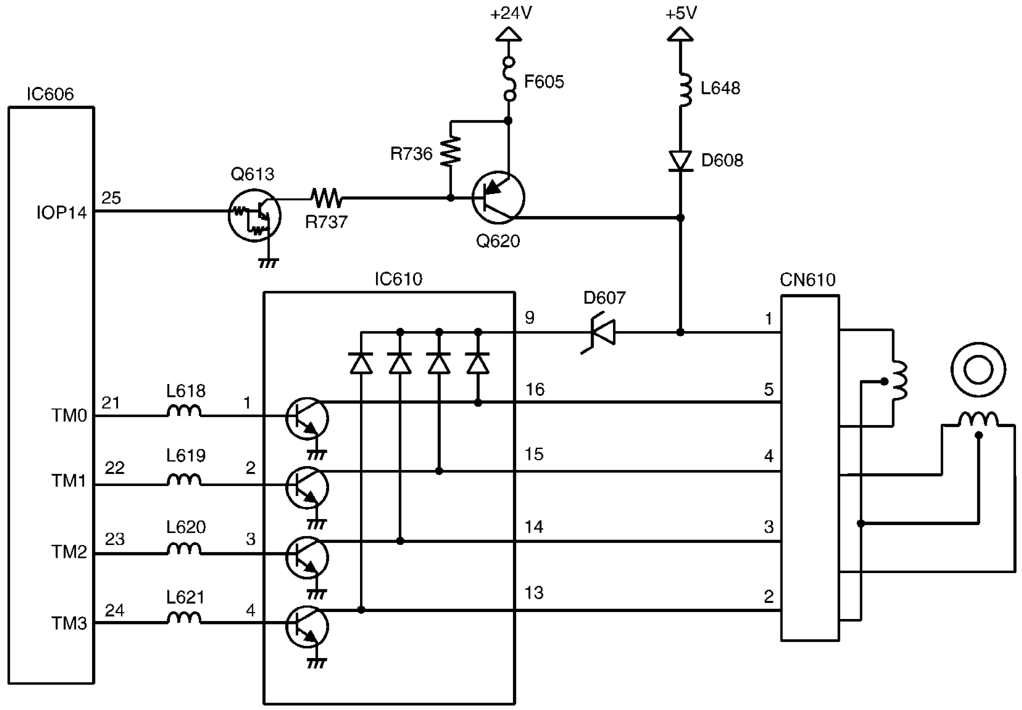


② 1-2 phase excitation output wave form (example "A Phase")



Other phase (B, *A, *B) operates as A phase does.

7.7.2.2. SCAN MOTOR (ADF MOTOR) DRIVE CIRCUIT

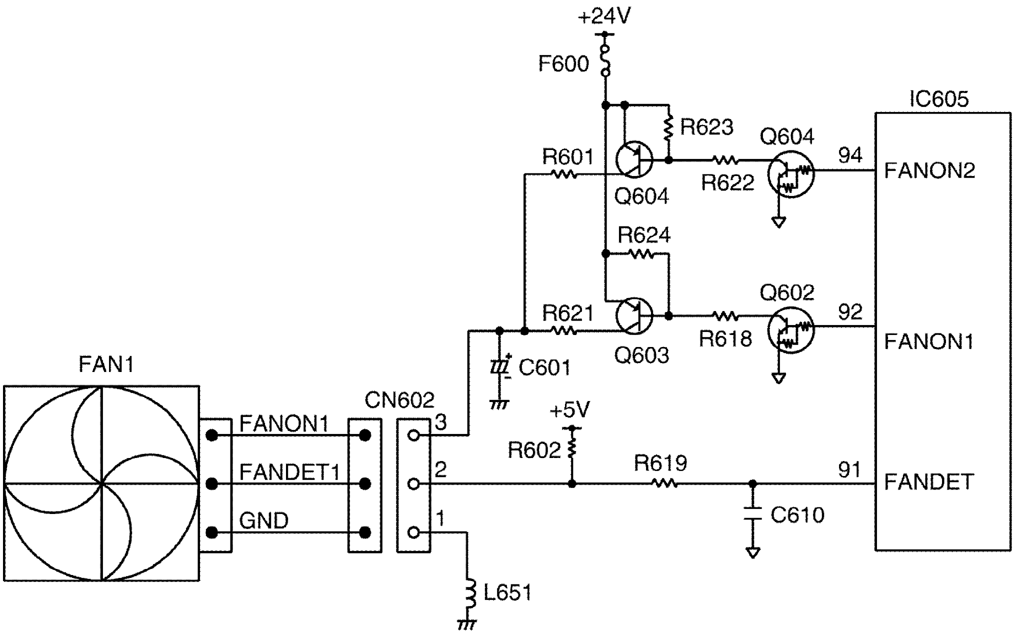

+24V
+5V
F605
L648
IC606
R736
D608
Q613
IOP14
25
R737
Q620
IC610
CN610
D607
9
1
L618
16
5
21
1
TM0
22
L619
2
15
4
TM1
L620
23
3
14
3
TM2
24
L621
4
13
2
TM3

DRIVE MODE

FUNCTION		MODE	PHASE PATTERN	SPEED
SCAN	FAX	STANDARD	2 phase	579pps
SCAN	FAX/COPY	FINE/PHOTO	2 phase	579pps
SCAN	FAX/COPY	SUPER FINE	1-2 phase	579pps
SCAN	FAX/COPY	PHOTO WITH TEXT	2 phase	579pps
SCAN	DOC.PREFEED/ EJECT	-	2 phase	579pps
STAND-BY		-	ALL PHASE OFF	-

7.8. FAN MOTOR SECTION

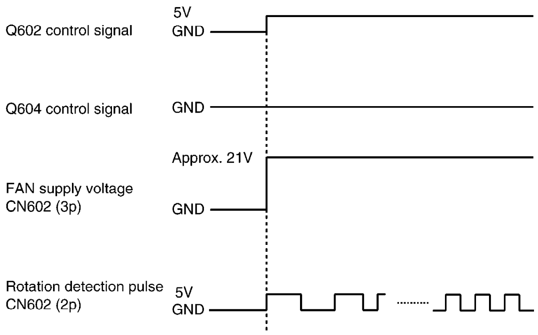
This FAN is used to radiate heat in the unit.
The signal level at pin 92/94 of IC605 becomes high, the FAN is activated. In this case, the pulse signal as shown below input to pin 91 of IC605 and the rotation of the FAN is detected.


+24V
F600
IC605
R623
Q604
94
FANON2
R601
Q604
R622
R624
Q602
R621
92
FANON1
Q603
R618
FAN1
C601
CN602
+5V
FANON1
3
R602
R619
91
FANDET
FANDET1
2
GND
1
C610
L651

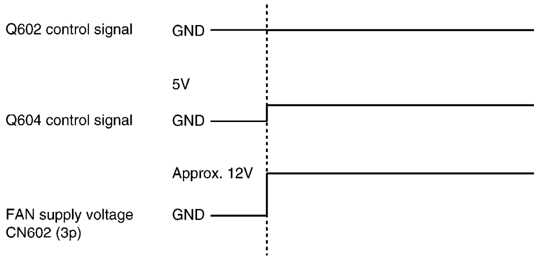
7.8.1. FAN CONTROL

This unit is equipped with fan to prevent the developing device from rising in temperature while printing.
The air is inhaled from the right side of the unit.
The fan rotates at high speed (Approx. 3000 rpm) while printing (controlling the developing device). After printing is finished, it rotates at low speed (Approx. 2200 rpm) when the temperature of the unit goes up over a fixed one or depending on the number of printed papers (frequency).
While the fan is rotating at high speed, the voltage of Approx. 21 V is supplied to the fan, however, while rotating at low speed, the supply voltage is decreased to Approx. 12V.
Each signal wave is as follows:

1. High-speed rotation (typ. 3000 rpm)

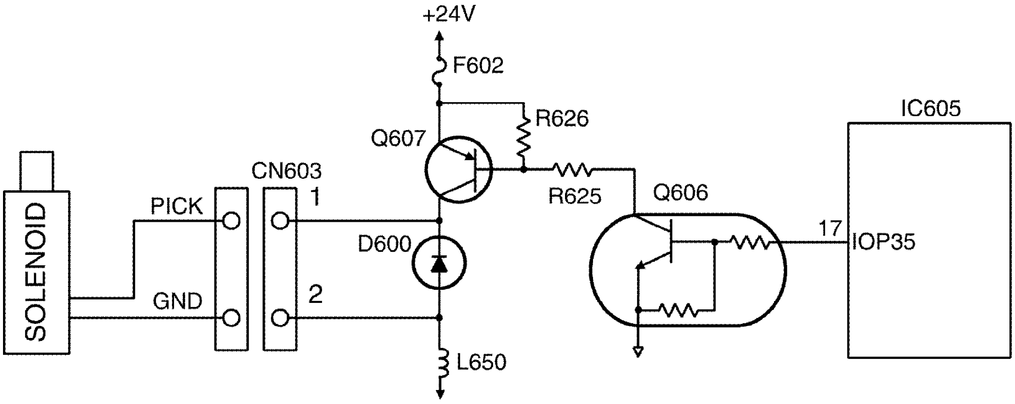

Q602 control signal
5V
GND
Q604 control signal
GND
Approx. 21V
FAN supply voltage
CN602 (3p)
GND
Rotation detection pulse
CN602 (2p)
5V
GND

2. Low-speed rotation (typ. 2200 rpm)


Q602 control signal
GND
5V
Q604 control signal
GND
Approx. 12V
FAN supply voltage
CN602 (3p)
GND

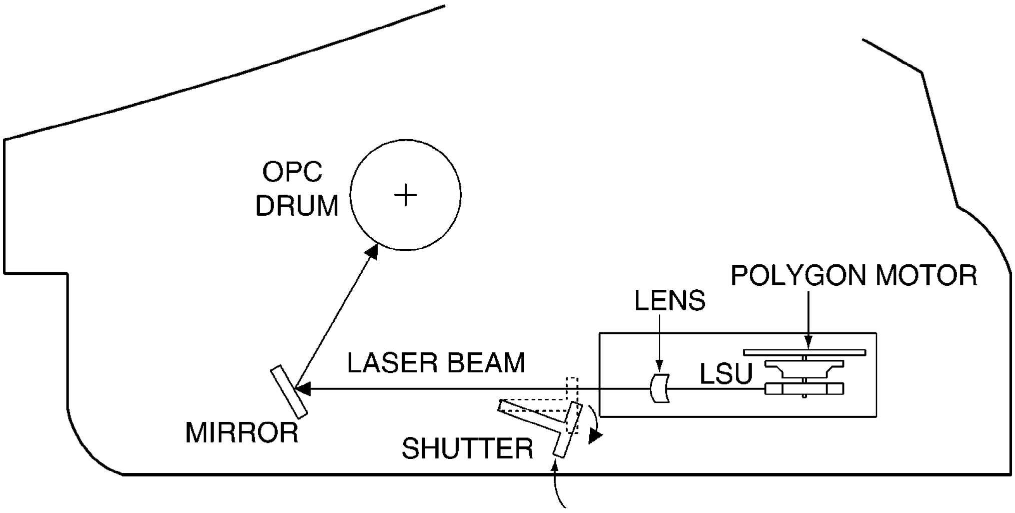
7.9. SOLENOID DRIVE SECTION

The solenoid drive circuit controls the pick-up clutch.
The solenoid is designed to be driven by +24V, driven by IC605-17 pin.
Diode D600 protects Q607 from backward voltage when the solenoid is driven.

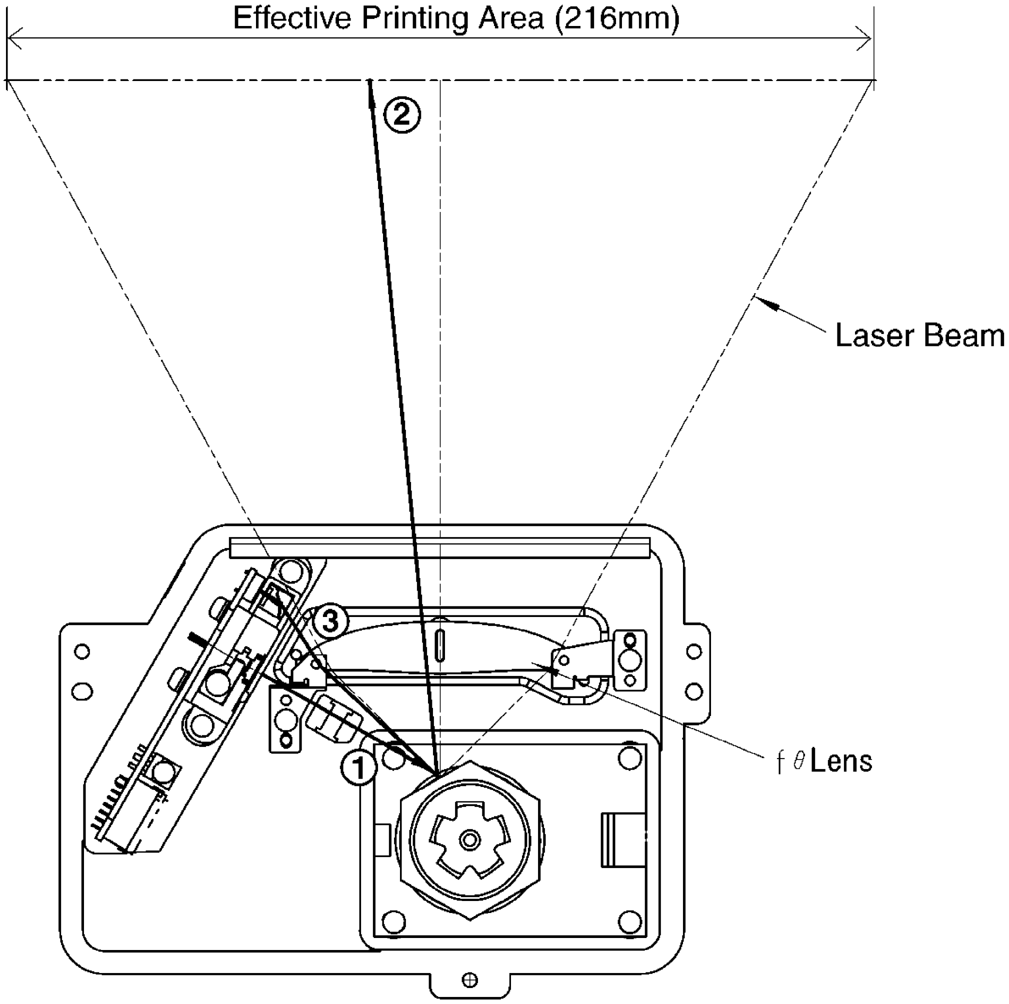

+24V
F602
R626
Q607
IC605
CN603
R625
Q606
PICK
1
SOLENOID
D600
17
IOP35
2
GND
L650

Mode	IC606-149 pin
SOLENOID ON	high level
SOLENOID OFF	low level

7.10. LSU (Laser Scanning Unit) SECTION


OPC
DRUM
POLYGON MOTOR
LENS
LASER BEAM
LSU
MIRROR
SHUTTER

The mechanical shutter will be opened by setting DRUM UNIT properly.

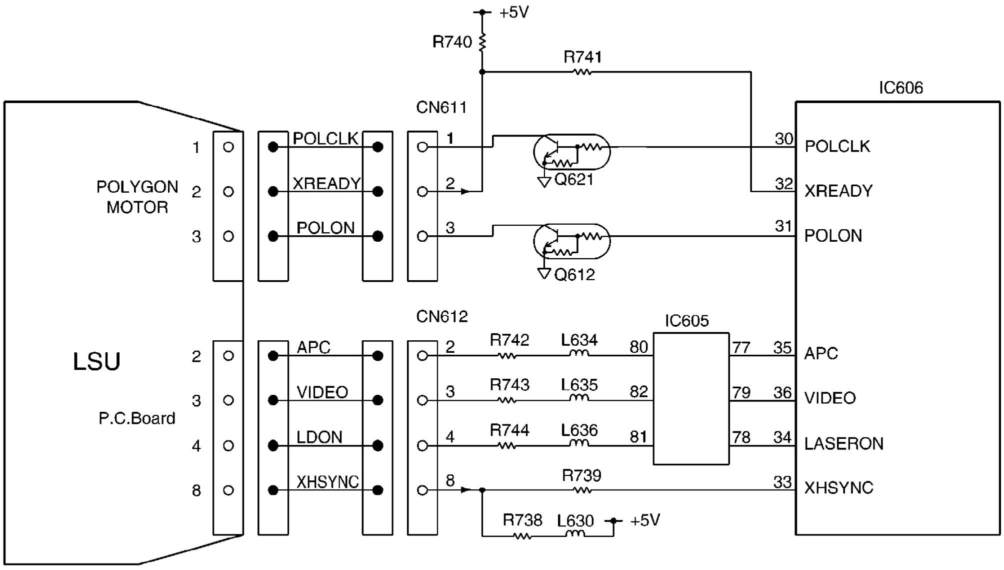

Effective Printing Area (216mm)
②
Laser Beam
③
f θ Lens
①

① Laser output

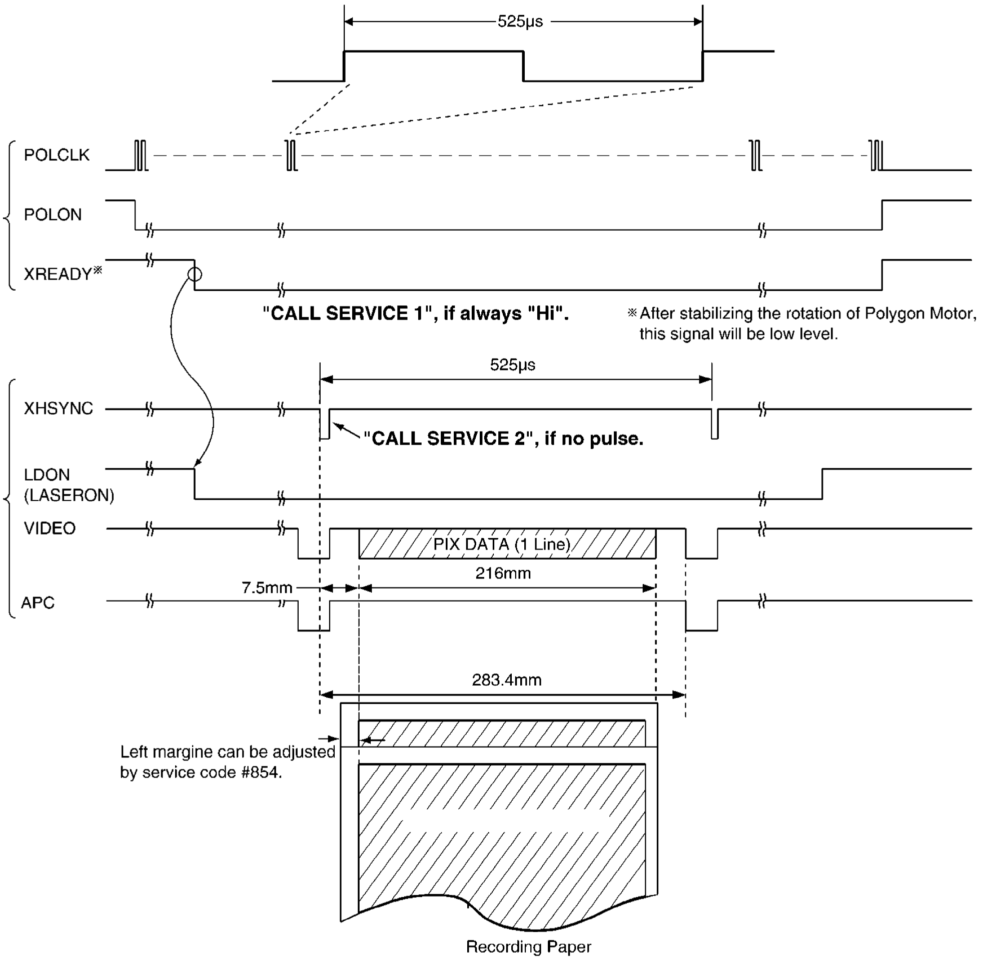
② Laser reflecting on the drum

③ Laser towards the effective printing outside range onto the sensor

Circuit Diagram


+5V
R740
R741
IC606
CN611
LSU
POLYGON MOTOR
P.C.Board
1
2
3
POLCLK
XREADY
POLON
Q621
Q612
30
32
31
POLCLK
XREADY
POLON
CN612
IC605
2
3
4
8
APC
VIDEO
LDON
XHSYNC
R742
L634
R743
L635
R744
L636
R739
80
82
81
77
79
78
35
36
34
33
APC
VIDEO
LASERON
XHSYNC
R738
L630
+5V

Timing Chart


525µs
POLCLK
POLON
XREADY※
XHSYNC
525µs
LDON
(LASERON)
VIDEO
PIX DATA (1 Line)
APC
7.5mm
216mm
283.4mm
Recording Paper

"CALL SERVICE 1", if always "Hi".

※After stabilizing the rotation of Polygon Motor, this signal will be low level.

"CALL SERVICE 2", if no pulse.

Left margine can be adjusted by service code #854.

7.11. SENSORS AND SWITCHES SECTION

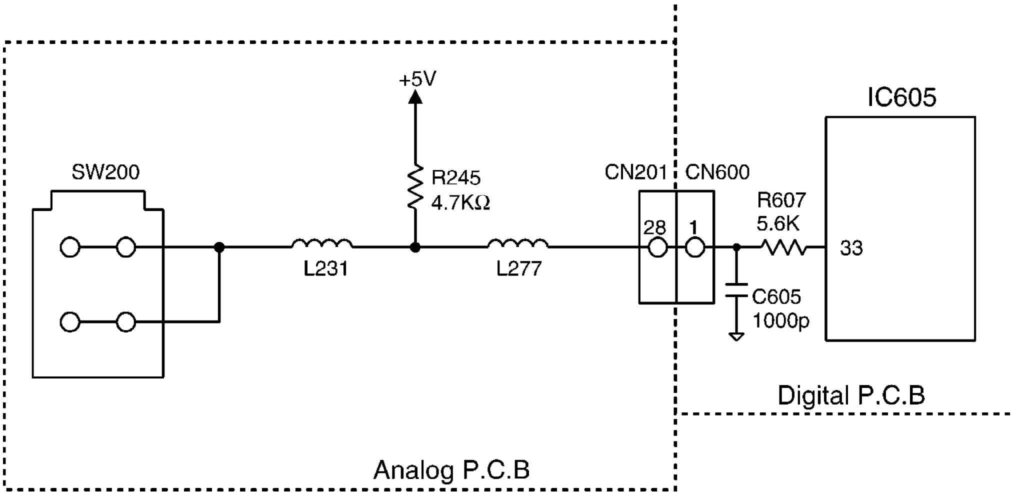
All of the sensor and switches are shown below.

Sensor Circuit Location	**Sensor**	**Sensor or Switch Name**	**Message Error**
Operation Panel	**PS101**	**Document set**	**[CHECK DOCUMENT]**
Operation Panel	**SW146**	**Paper Feed**	**[REMOVE DOCUMENT]**
High Voltage PCB	**SW101**	**Printer Open**	**[COVER OPEN]**
Toner Sensor PCB	**SW60**	**OPC Set**	**[CHECK DRUM]**
Digital PCB	**PS601**	**Register**	**[FAILED PICKUP]**
Digital PCB	**PS600**	**Paper**	**[OUT OF PAPER]**
Exit Sensor PCB	**PS51**	**Exit**	**[PAPER JAMMED]**
Toner Sensor PCB	**SW60,IC60**	**Dev & Toner Set**	**[TONER EMPTY] / [TONER LOW] [CHECK DRUM]**
Analog PCB	**SW200**	**Hook**	———

Note:
See TEST FUNCTIONS - SENSOR CHECK SECTION for the sensor test.
(#815 of Service Mode test. Refer to TEST FUNCTIONS ().

7.11.1. HOOK SWITCH

When the handset is raised, the switch is turned OFF, and the signal at pin 33 of IC605 is high. / When the handset is returned, the switch is turned ON, and the signal at pin 53 of IC605 is low.



7.11.2. DOCUMENT SENSOR

The Sensor detects whether or not a document is in place. / When a document is detected, the shelter plate shuts off the sensor light, the photo-transistor turns OFF, and the input signal of IC101-19pin becomes a high level. When there is no document, the shelter plate let the sensor

light pass through, the photo-transistor turns ON, and the input signal of IC101-19pin becomes a low level.

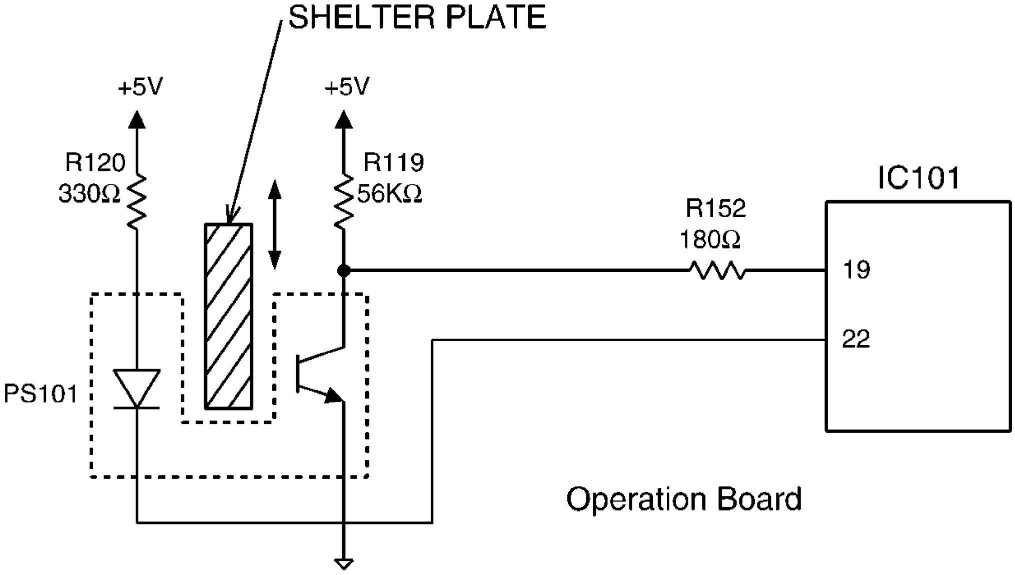
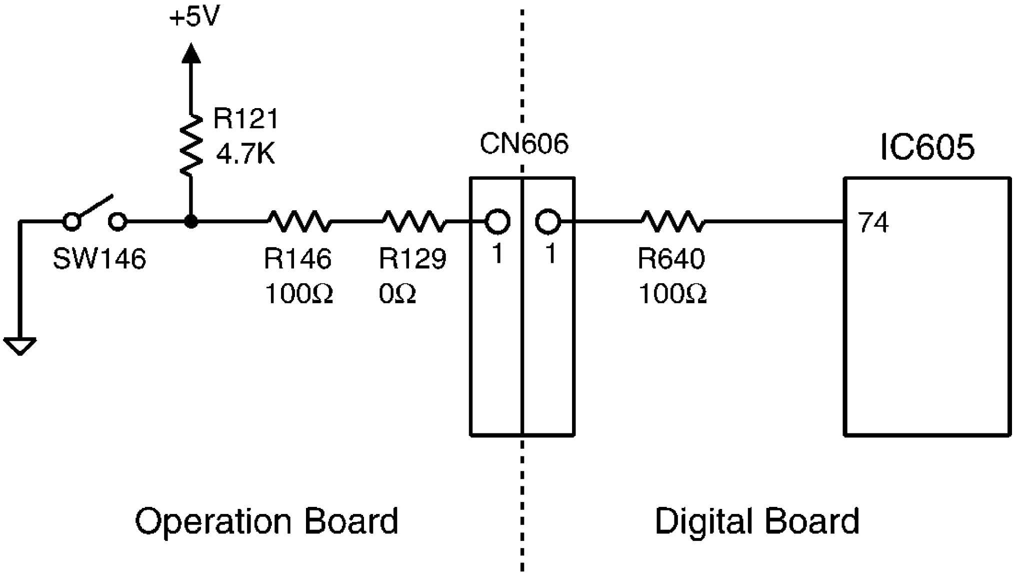

SHELTER PLATE
+5V
+5V
R120
330Ω
R119
56KΩ
R152
180Ω
IC101
19
22
PS101
Operation Board

	Photo-transistor	**Signal (IC101-19pin)**
Document Set	**OFF**	**High level**
No Document	**ON**	**Low level**

7.11.3. PAPER FEED SENSOR

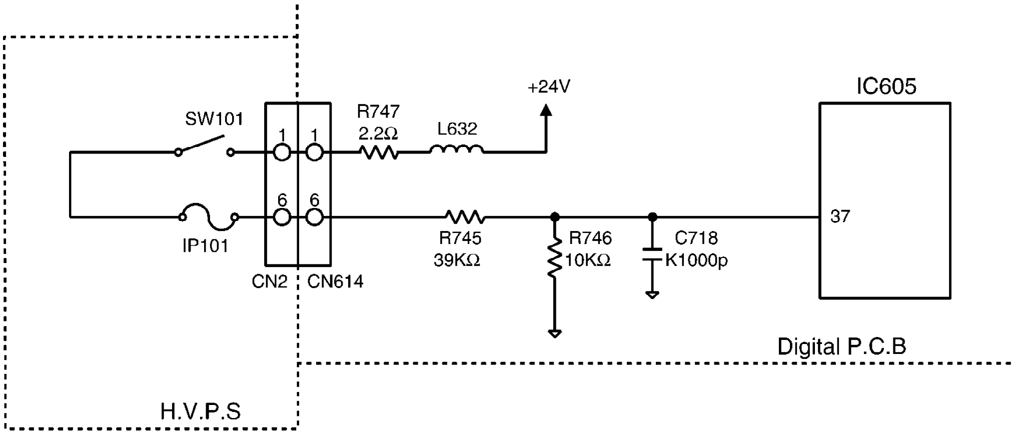
The Sensor detects the front edge of the document. / When a document is detected, the switch turns ON, and the input signal of IC605-74pin becomes a low level. When there is no document, the switch turns OFF, and the input signal of IC605-74pin becomes a high level.


+5V
R121
4.7K
CN606
IC605
SW146
R146
100Ω
R129
0Ω
1
1
R640
100Ω
74
Operation Board
Digital Board

	Switch	Signal (IC605-74pin)
Read Position	ON	Low level
Non Read Position	OFF	High level

7.11.4. TOP COVER OPEN SWITCH

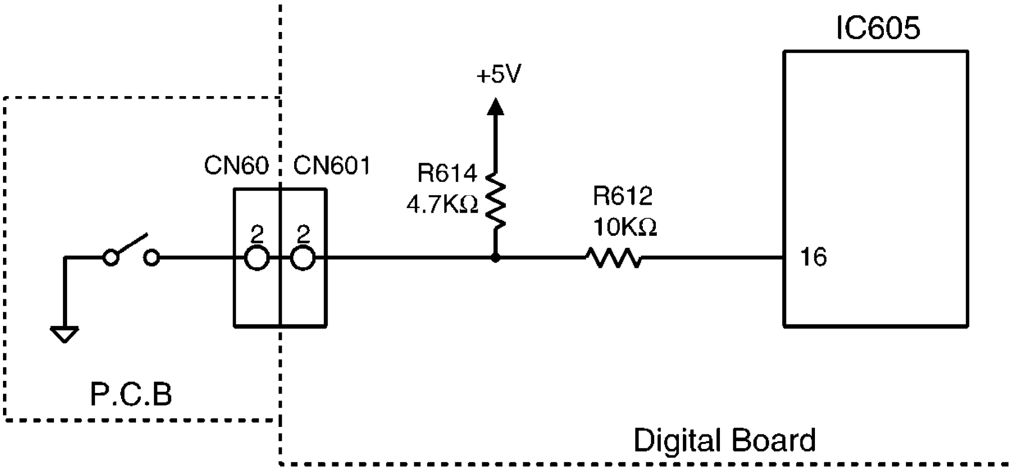
The Switches detect whether the printer cover is open or closed. / When the printer cover is closed, the switches turn ON, and the input signal of IC605-37pin becomes a high level. / When the printer cover is open, the switches turns OFF, and the input signal of IC605-37pin becomes a low level.


+24V
IC605
SW101
R747
2.2Ω
L632
1
1
6
6
37
IP101
R745
39KΩ
R746
10KΩ
C718
K1000p
CN2
CN614
Digital P.C.B
H.V.P.S

	Switch	Signal (IC605-37 pin)
Open	OFF	Low level
Close	ON	High level

7.11.5. DRUM SENSOR

The Switch detects whether the OPC unit is set or not. / When there is the DRUM unit, the input signal of IC605-16pin becomes a high level. / When there is no DRUM unit, the input signal of IC605-16pin becomes a low level.


IC605
+5V
CN60
CN601
R614
4.7KΩ
R612
10KΩ
2
2
16
P.C.B
Digital Board

	Signal (IC605-16 pin)
DRUM Set	High level
No DRUM	Low level

7.11.6. REGIST SENSOR

The Sensor detects whether or not the recording paper is present so that printing can start. / When the recording paper is detected, the shelter plate let the sensor light passing through, the photo-transistor turns ON, and the input signal of IC605-5pin becomes a low level. / When there is no recording paper, the shelter plate closes the sensor light, the photo-transistor turns OFF, and the input signal of IC605-5pin becomes a high level.

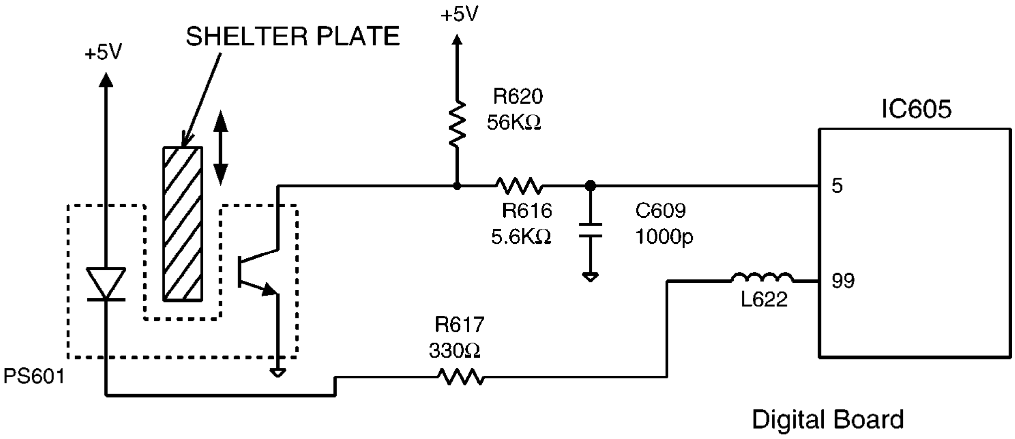

+5V
SHELTER PLATE
+5V
R620
56KΩ
IC605
5
R616
5.6KΩ
C609
1000p
99
L622
R617
330Ω
PS601
Digital Board

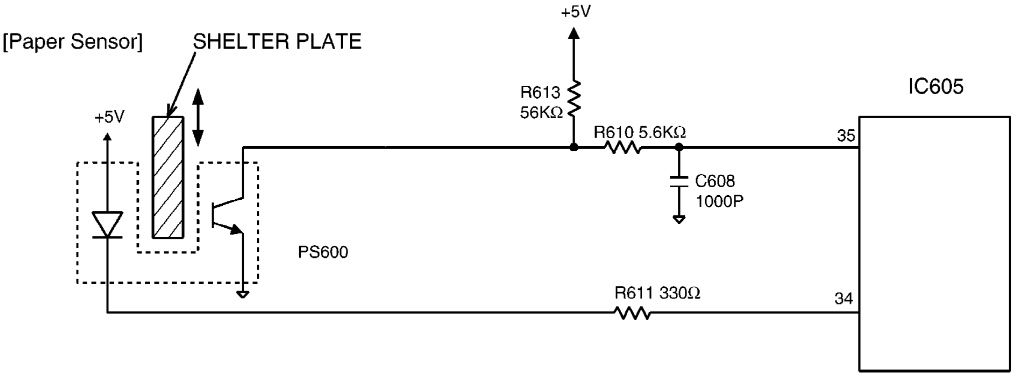
	Photo-transistor	Signal (IC605-5 pin)
No Recording Paper	OFF	High level
Recording Paper Regist	ON	Low level

7.11.7. PAPER SENSOR..... “OUT OF PAPER”

The Sensor detects the recording paper are in place.

When the recording paper is detected, the shelter plate let the sensor light passing through, the photo-transistor turns ON, and the input signal of IC605-35 pin becomes a low level.

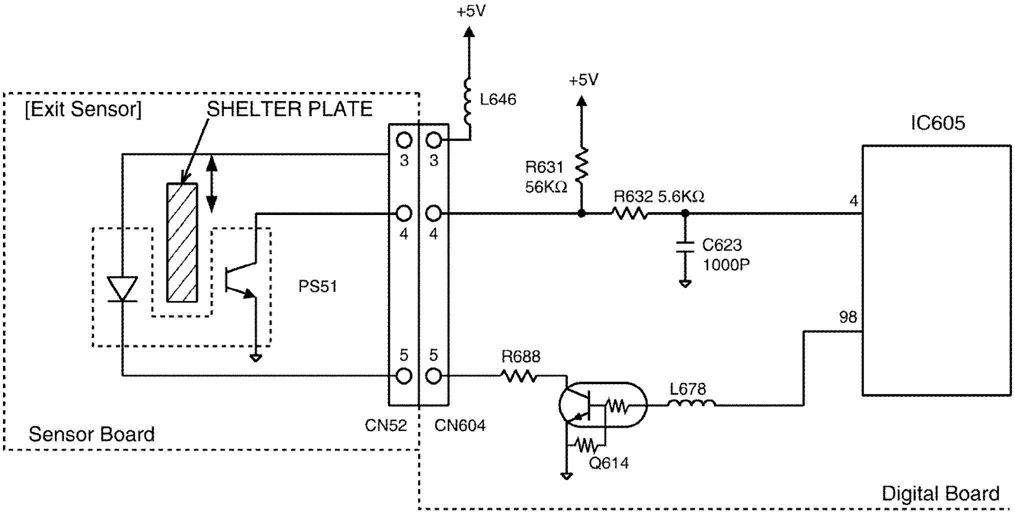
When there is no recording paper, the shelter plate closes the sensor light, the photo-transistor turns OFF, and the input signal of IC605-35 pin becomes a high level.


[Paper Sensor]
SHELTER PLATE
+5V
+5V
R613
56KΩ
R610 5.6KΩ
IC605
35
C608
1000P
PS600
R611 330Ω
34

[Paper Sensor]

	Photo-transistor	Signal (IC605-35 pin)
Recording Paper Set	OFF	Low level
No Recording Paper	ON	High level

7.11.8. PAPER EXIT SENSOR..... “PAPER JAMMED”


+5V
L646
+5V
[Exit Sensor]
SHELTER PLATE
IC605
3
3
R631
56KΩ
R632 5.6KΩ
4
4
4
C623
1000P
PS51
98
5
5
R688
L678
Sensor Board
CN52
CN604
Q614
Digital Board

The sensor detects whether the recording paper exit out or noy.

When there is no recording paper at the position of the sensor, the shelter plate closes the sensor light, the photo-transistor fot tarus OFF, and the input signal of IC605-4pin becomes high level.

When the recording paper reach the exit sensor, the shelter plate let the sensor light passing through, the photo-transistor ON, and the input signal of IC605-4pin becomes a low level.

[Exit Sensor]

	Photo-transistor	Signal (IC605-4 pin)
No Paper	OFF	High level
Paper Exist	ON	Low level

7.11.9. Detecting New Drum Units

Purpose

To investigate the actual number of printed papers with the drum units

(Investigating how the returned sets' drum units were used)

Method

Whether the drum unit is new or old should be judged by detecting the turn delay of Mixing

Paddle (Toner detection sensor).

- **When shipping the drum unit, the mixing paddle gear is set to the position that has the space of more than one turn (max. 600).**
- **After the main motor starts, when the toner detection signal is not varied within the fixed time (max. 4.5 sec), the drum unit is found new.**

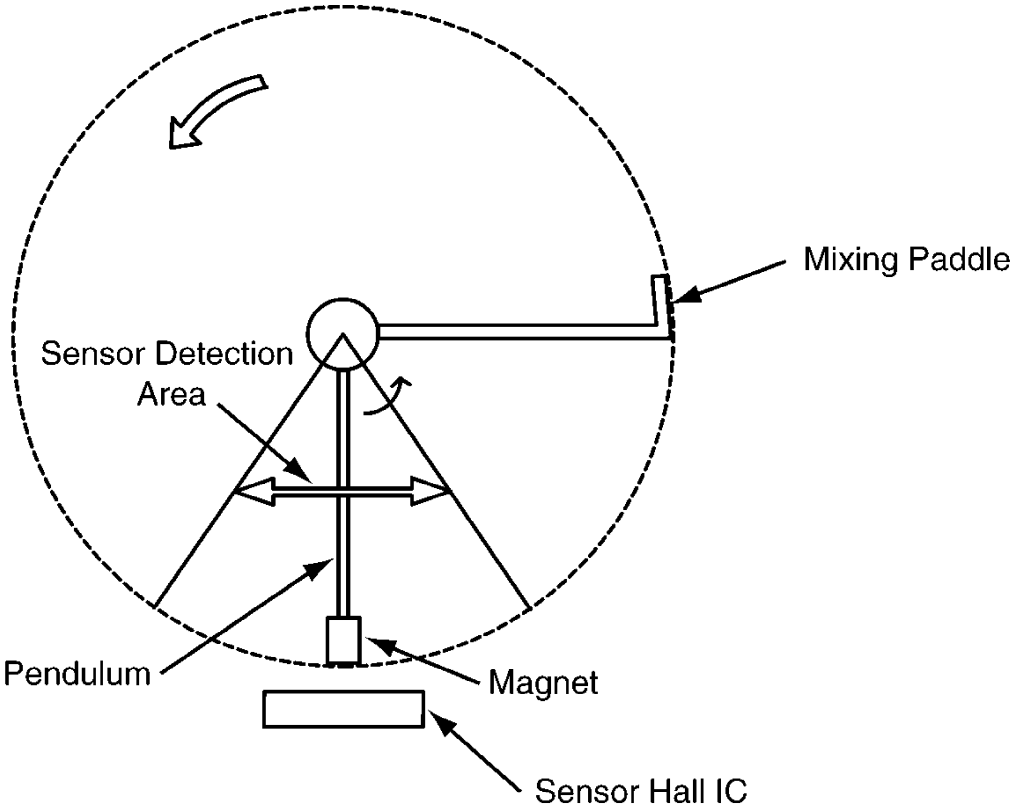
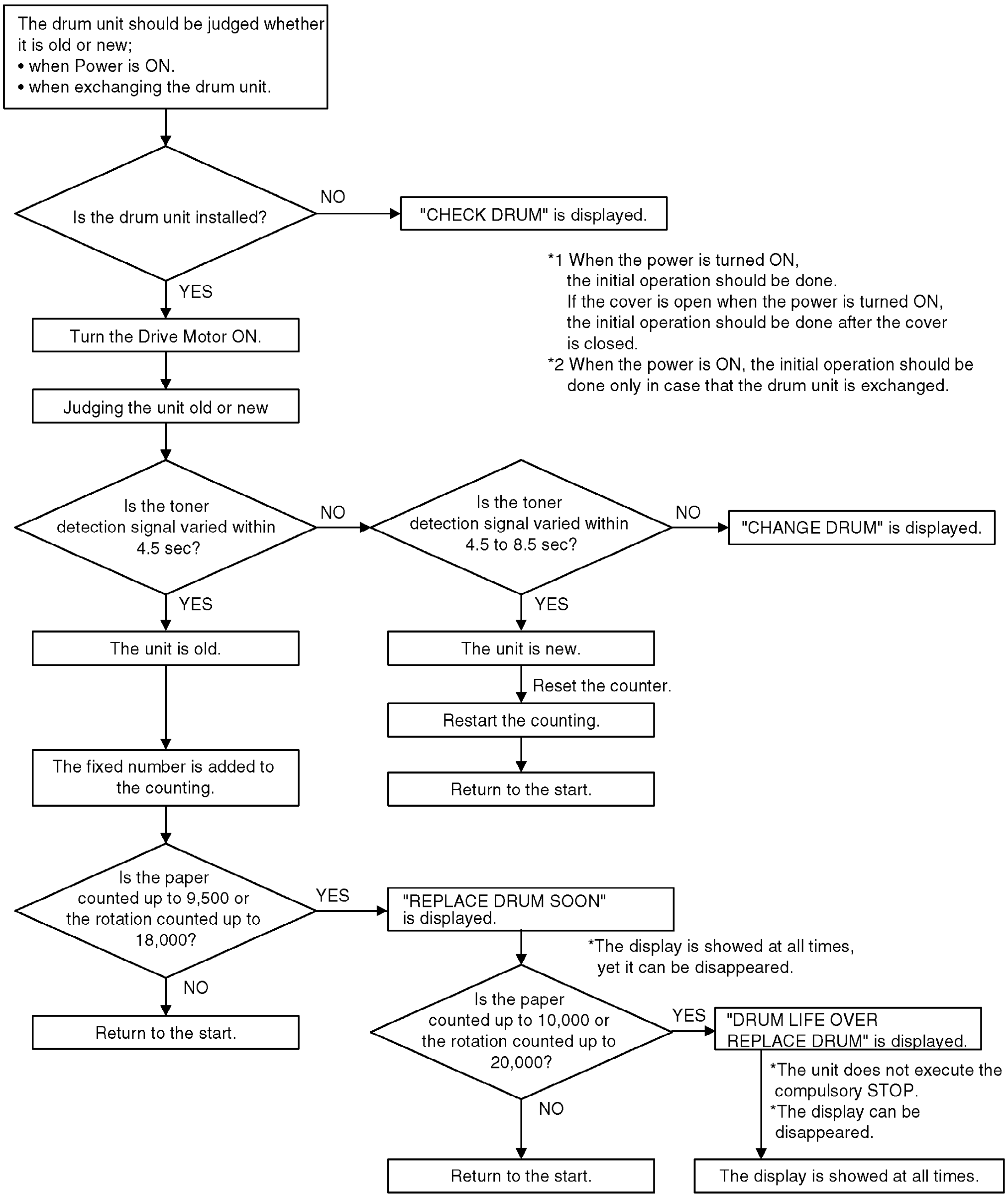

Mixing Paddle
Sensor Detection Area
Pendulum
Magnet
Sensor Hall IC

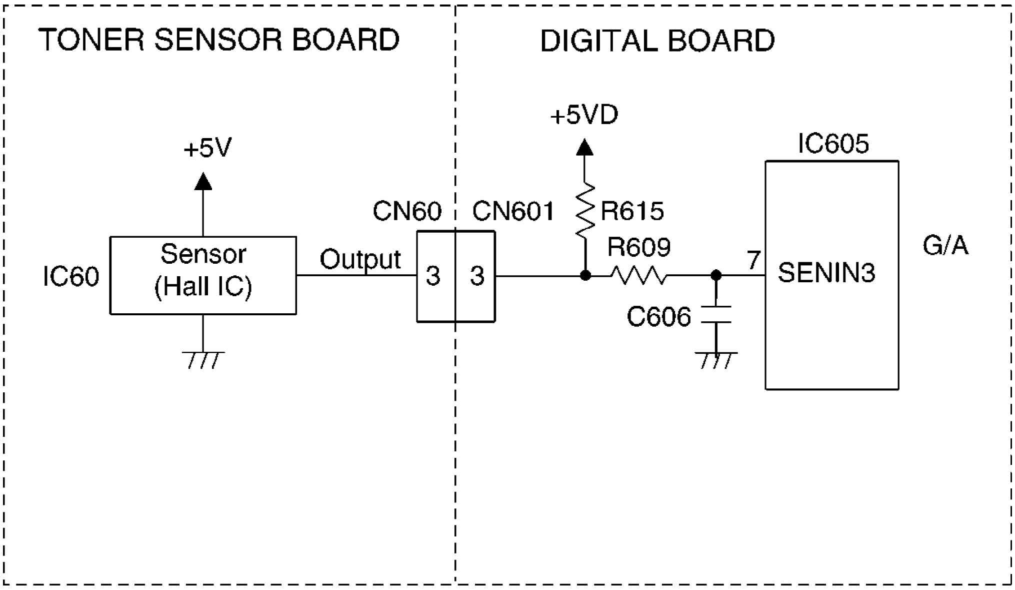
Fig. a

Detection Flowchart

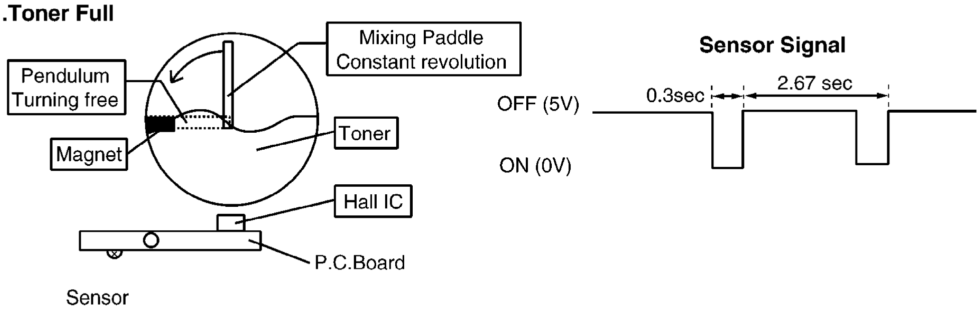

The drum unit should be judged whether it is old or new;
• when Power is ON.
• when exchanging the drum unit.
Is the drum unit installed?
NO
"CHECK DRUM" is displayed.
YES
Turn the Drive Motor ON.
Judging the unit old or new
*1 When the power is turned ON, the initial operation should be done. If the cover is open when the power is turned ON, the initial operation should be done after the cover is closed.
*2 When the power is ON, the initial operation should be done only in case that the drum unit is exchanged.
Is the toner detection signal varied within 4.5 sec?
NO
Is the toner detection signal varied within 4.5 to 8.5 sec?
NO
"CHANGE DRUM" is displayed.
YES
The unit is old.
YES
The unit is new.
Reset the counter.
Restart the counting.
Return to the start.
The fixed number is added to the counting.
Is the paper counted up to 9,500 or the rotation counted up to 18,000?
YES
"REPLACE DRUM SOON" is displayed.
*The display is showed at all times, yet it can be disappeared.
NO
Return to the start.
Is the paper counted up to 10,000 or the rotation counted up to 20,000?
YES
"DRUM LIFE OVER REPLACE DRUM" is displayed.
*The unit does not execute the compulsory STOP.
*The display can be disappeared.
NO
Return to the start.
The display is showed at all times.

7.11.10. TONER SENSOR.... “TONER EMPTY”, “TONER LOW”, “CHANGE DRUM”

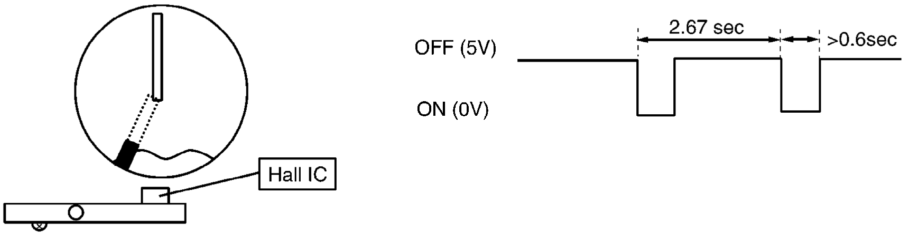
The Sensor detects whether or not the Drum unit and the toner are present.
When there is not Drum unit, Hall IC (IC60) turns off, and the input signal of IC605-7 pin (Digital P.C.B) becomes a High level over 9s. When the Developer unit is set, Hall IC (IC60) turns ON/ OFF. If the time of IC605-7 pin's Low level is under 600ms, there is enough toner in Developer unit, if not, toner is near empty.


TONER SENSOR BOARD
DIGITAL BOARD
+5V
IC60
Sensor (Hall IC)
Output
CN60
CN601
3
3
+5VD
R615
R609
C606
7
IC605
SENIN3
G/A

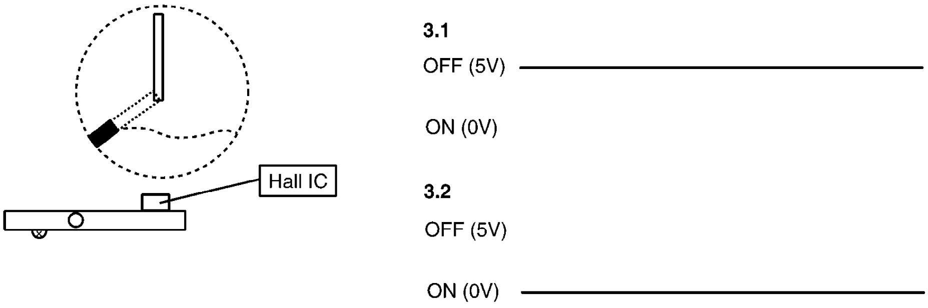
1.Toner Full


Pendulum Turning free
Mixing Paddle Constant revolution
Magnet
Toner
Hall IC
P.C.Board
Sensor
Sensor Signal
OFF (5V)
ON (0V)
0.3sec
2.67 sec

2. Toner Low


Hall IC
OFF (5V)
ON (0V)
2.67 sec
>0.6sec

3. In case the Mixing Paddle does not rotate


Hall IC
3.1
OFF (5V)
ON (0V)
3.2
OFF (5V)
ON (0V)

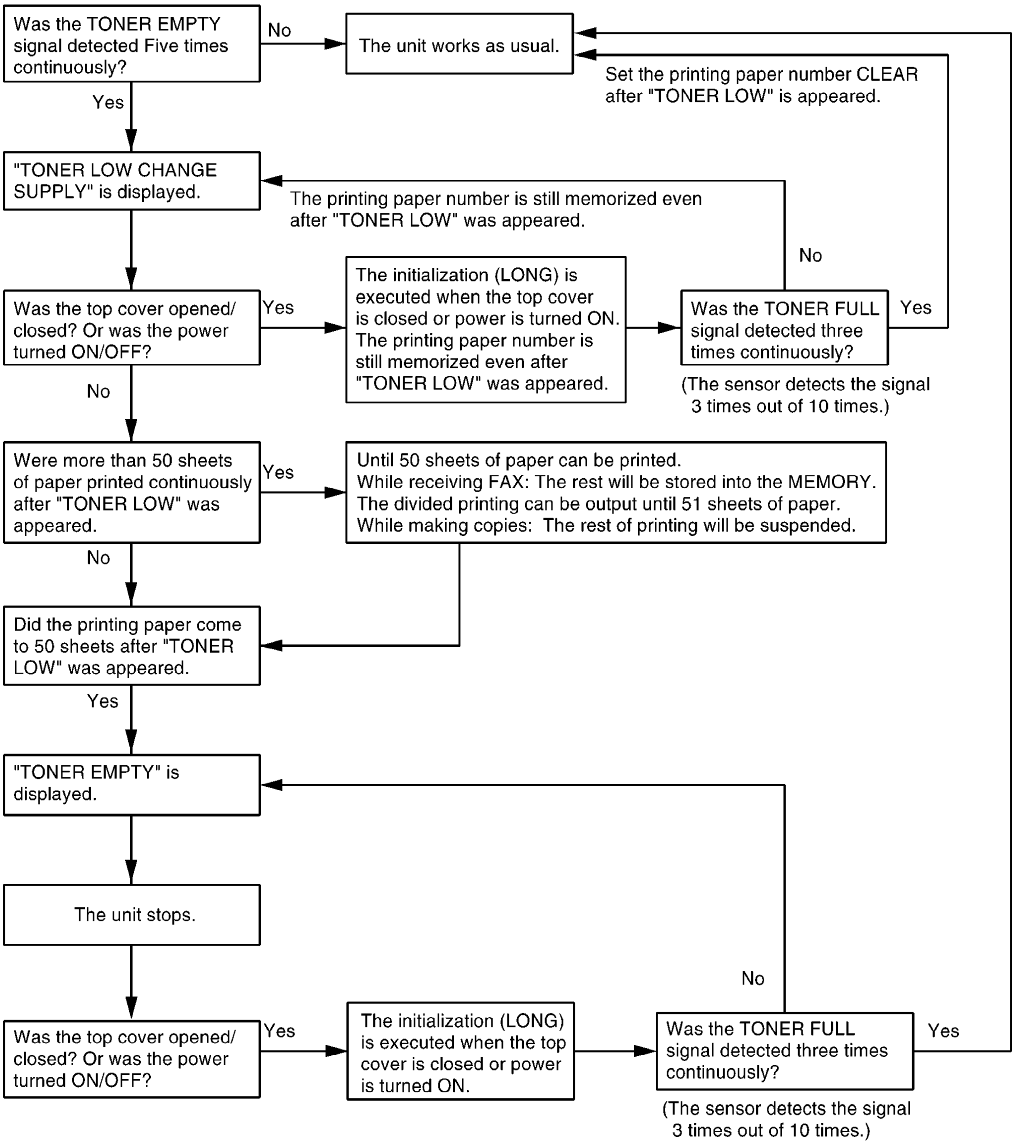
Toner Sensor

The rest of toner is detected by the move speed of the magnet put on the pendulum of Mixing Paddle. The pendulum is pushed up by the Mixing Paddle, then it falls down by its own weight. The rotation speed of paddle is set slower than the one of pendulum which falls down by its

own weight. When the toner is still left, the pendulum falls and stops on the toner, then pushed by the paddle, it starts to rotate. When no toner is left, the pendulum falls to the bottom. Consequently the contact time between the magnet and steel becomes short when toner is left and long with no toner.

State	Display	Signal (IC605-7pin)
Toner Set (full)	-	Low level = about 0.3s
Near Empty Toner	TONER LOW	Low level>0.6s
Mixing Paddle does not rotate ("CHANGE DRUM")	CHANGE DRUM	High level fix or Low level fix

7.11.10.1. TONER DETECTION FLOW


Was the TONER EMPTY signal detected Five times continuously?
No
The unit works as usual.
Set the printing paper number CLEAR after "TONER LOW" is appeared.
Yes
"TONER LOW CHANGE SUPPLY" is displayed.
The printing paper number is still memorized even after "TONER LOW" was appeared.
No
Was the top cover opened/ closed? Or was the power turned ON/OFF?
Yes
The initialization (LONG) is executed when the top cover is closed or power is turned ON. The printing paper number is still memorized even after "TONER LOW" was appeared.
Was the TONER FULL signal detected three times continuously?
Yes
(The sensor detects the signal 3 times out of 10 times.)
No
Were more than 50 sheets of paper printed continuously after "TONER LOW" was appeared.
Yes
Until 50 sheets of paper can be printed. While receiving FAX: The rest will be stored into the MEMORY. The divided printing can be output until 51 sheets of paper. While making copies: The rest of printing will be suspended.
No
Did the printing paper come to 50 sheets after "TONER LOW" was appeared.
Yes
"TONER EMPTY" is displayed.
The unit stops.
No
Was the top cover opened/ closed? Or was the power turned ON/OFF?
Yes
The initialization (LONG) is executed when the top cover is closed or power is turned ON.
Was the TONER FULL signal detected three times continuously?
Yes
(The sensor detects the signal 3 times out of 10 times.)

CAUTION:

1. Toner low can be judged by continuous 5-times TONER LOW

signal at only printing.
(It is not executed at.)

2. **Toner full can be judged by continuous 3-times TONER FULL signal at initialization.**
   (It is not executed at printing.)
3. **In the ordinal operation, “CHECK DRUM” is displayed when TONER EMPTY sensor does not generate a signal for 2.7 seconds.**

7.12. OPERATION BOARD SECTION

The unit consists of a LCD (Liquid crystal display), KEYs and LEDs (light-emitting diodes). They are controlled by the Gate Array (IC101) and ASIC (IC610: on the DIGITAL BOARD).
The key matrix table is shown below.

1. Key Matrix

A. Hard Scan

	KIN0	KIN1	KIN2	KIN3	KIN4	KIN5	KIN6	K
KSL0	AUTO ANSWER	CALLER IQ	NEXT	STOP	MENU	FLASH	H/S MUTE	RE P
KSL1	QUICK SCAN	S6	VOL-	CID-SEARCH	DIRECTORY/PROGRAM	#	0	
KSL2	COPY	----------	PREV	CID-PRINT	----------	9	8	
KSL3	RESOLUTION	COLLATE	----------	S12	MONITOR	3	2	
KSL4	FAX START	----------	VOL+	S11	HELP	6	5	

***LED7 should be set to KSL4. "8 x 5" key matrix is executed by hardware scanning.**

B. Soft Scan

	SKIN0 (XLED8)	KIN1 (XLED12)	KIN2 (XLED11)
SKS0 (LED6)	S10	S7	S9
SKS1 (XLED9)	S4	S2	S3
SKS2 (XLED10)	S5	S1	S8

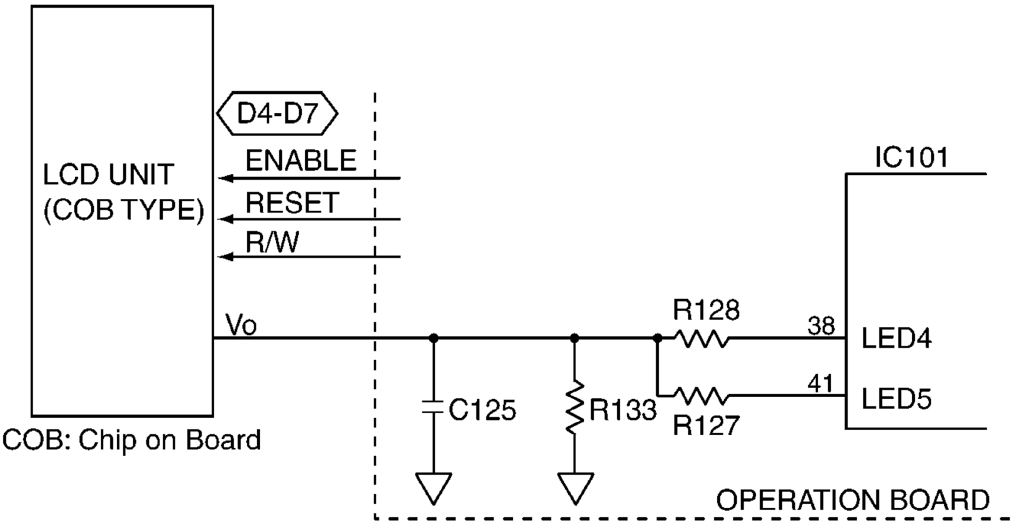
2. LED

- **AUTO ANSWER LED ON/OFF port---LED2**
- **CALLER IQ LED ON/OFF port---LED3**

7.13. LCD SECTION

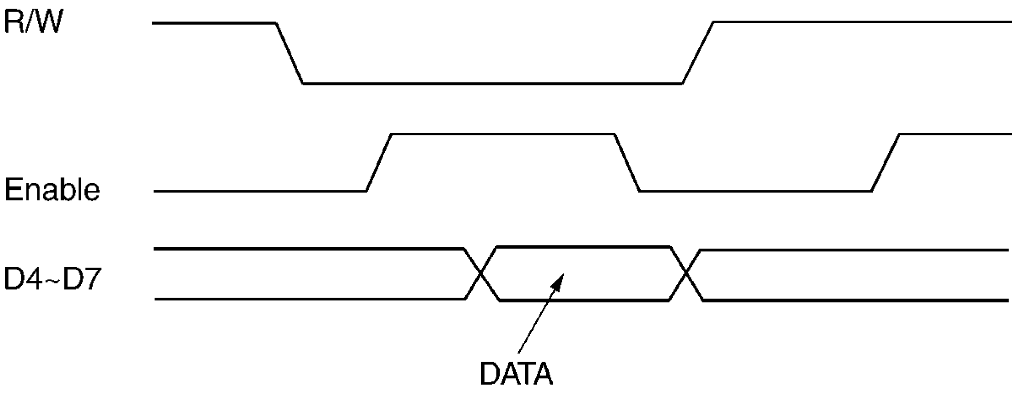
The Gate Array (IC101) works only for writing the ASCII code from the data bus (D4~D7). V0 is supplied for the crystal drive.
R130 and R134 are density control resistors.
Consequently, in this unit, the timing (positive clock) is generated by the LCD interface circuitry in the gate array (IC101).

Circuit Diagram



LCD UNIT
(COB TYPE)
D4-D7
ENABLE
RESET
R/W
Vo
C125
R133
R128
R127
38
41
IC101
LED4
LED5
COB: Chip on Board
OPERATION BOARD

Timing Chart



R/W
Enable
D4~D7
DATA

<Density>

Display mode	User setting	LED4	LED5
2 LINE	NORMAL	H	L
	DARKER	L	L
Large	NORMAL	H	H
	DARKER	H	L

7.14. HVPS (High Voltage Power Supply) SECTION

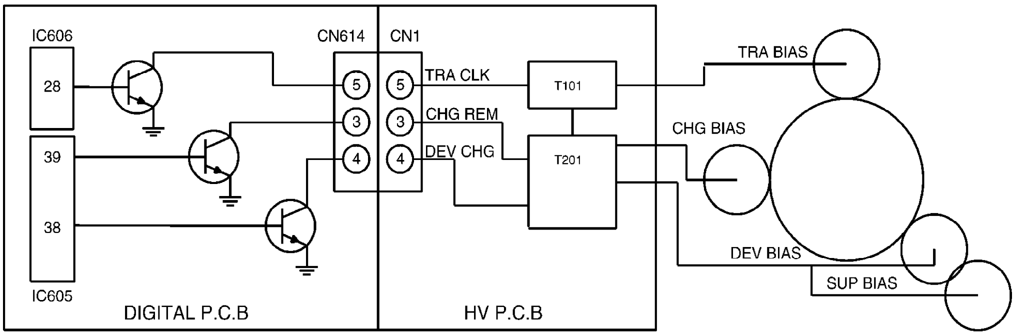
7.14.1. HVPS SPECIFICATION

No	Output voltage	Item	Specification	Notes
1	Electrostatic Charge CHG BIAS	Rate output voltage	-1000±30V	
		Impedance range	50M~1000M Ω	
		Output format	Constant voltage	
2	Developing DEV(-) BIAS	Rate output voltage	-200±15V	
		Impedance range	10M~2000M Ω	
		Output format	Constant voltage	
	Developing DEV(+) BIAS	Rate output voltage	+150+20V	
		Output format	Constant voltage	
3	Transfer TRA(+) BIAS	Variable output current	+4~25 μ A	Output current varies with the rate.
		Output voltage	+3500V Max.	
		Output format	Variable Constant current	
	Transfer TRA(-) BIAS	Rate output voltage	-1000±100V	
		Output format	Constant voltage	

DEV BIAS is output from one of the output terminals after the DEV CHG signal selects DEV(+) BIAS and DEV(-) BIAS.

TRA BIAS is output from one of the output terminals after the TRA CLK signal selects TRA(+) BIAS and TRA(-) BIAS.

H.V.P.S.(High Voltage Power Supply) Circuit Diagram



7.14.2. CHG-BIAS (Charge BIAS)/DEV(-) BIAS (Developing(-) BIAS)/DEV(+) BIAS (Developing(+) BIAS) UNIT

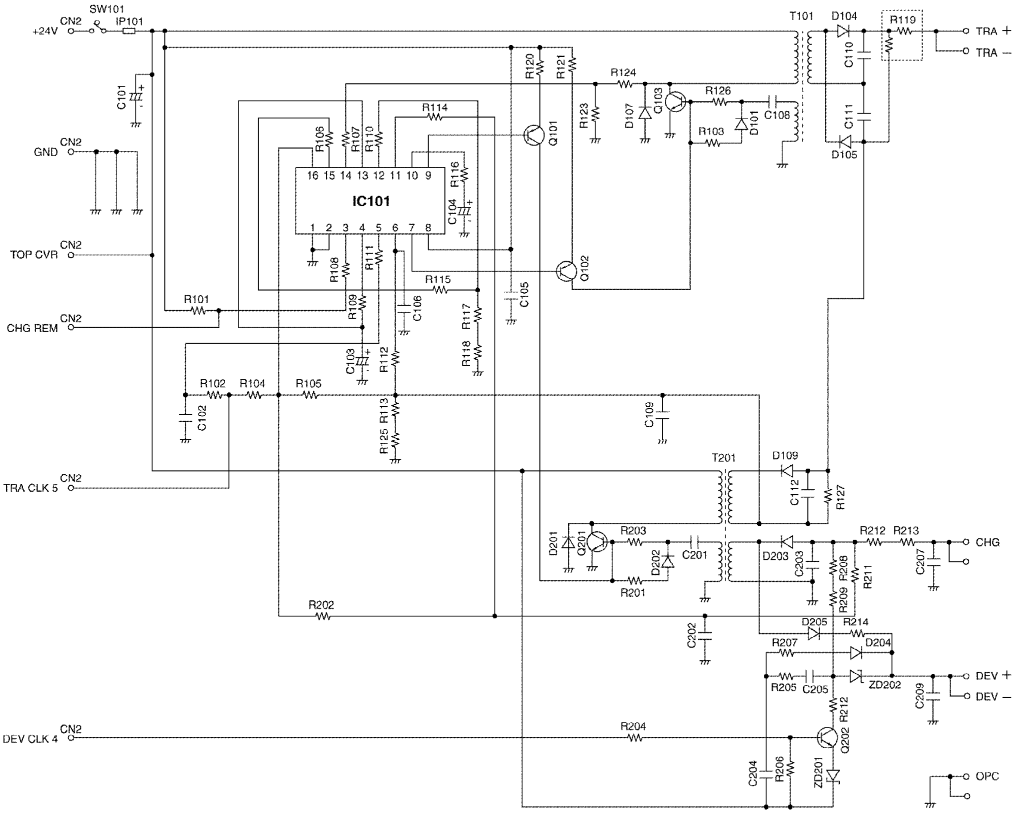
When the CHG REM terminal becomes “L”, the transistor Q201 turns ON by IC101, Charge BIAS(-1000V) is output from CHG OUTPUT, Developing(-) BIAS(-200V) is output from DEV(-) BIAS. After that, when DEV CHG terminal becomes “L”, Q202 turns ON, and Developing(+) BIAS(+150V) is output from DEV(+) BIAS.

7.14.3. TRA(+) BIAS (Transfer(+) BIAS)/TRA(-) BIAS (Transfer(-) BIAS) UNIT

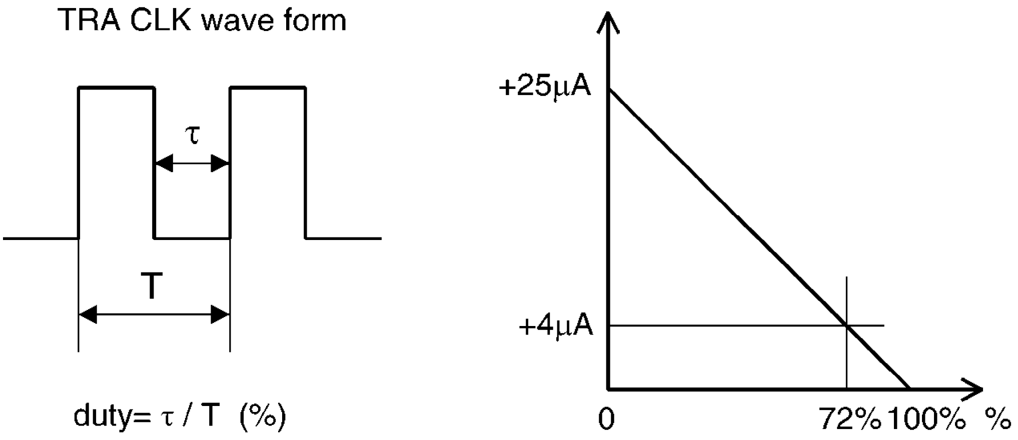
When the CHG REM terminal is “L” and the TRA CLK terminal is “Open”, Transfer(-) BIAS(-1000V) is output from TRA OUTPUT the moment Charge BIAS(-1000V) is output from CHG OUTPUT. When 7.8KHz PWM (pulse-width modulation) signal is input to the TRA CLK terminal, Q103 turns ON by IC101, and TRA(+) CURRENT BIAS according to the PWM signal is output

from TRA OUTPUT. The PWM signal will be turned to a constant voltage by the resistor and the condenser, and input to the IC101. The IC101 compares this voltage with the feedback voltage from T101 and controls the Q103. As for the transfer current, +25 μ A is output when DUTY of the TRA CLK input signal is 0%, or +4 μ A is output when that is 72%.

Circuit Diagram


SW101
CN2
IP101
+24V
C101
GND
TOP CVR
CHG REM
TRA CLK 5
DEV CLK 4
IC101
16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8
R101
R102
R104
R105
C102
R106
R107
R110
R114
R116
C104
R108
R111
R109
R115
C106
C103
R112
R113
R125
R117
R118
R120
R121
Q101
Q102
C105
R123
R124
D107
Q103
R126
R103
D101
C108
C109
T101
D104
R119
C110
C111
D105
TRA +
TRA –
T201
D109
C112
R127
D201
Q201
R203
D202
C201
R201
D203
C203
R208
R209
R211
R212
R213
C207
CHG
R202
C202
D205
R214
D204
R207
R205
C205
ZD202
C209
DEV +
DEV –
R204
Q202
C204
R206
ZD201
OPC

Transfer Current Variation by PWM Input

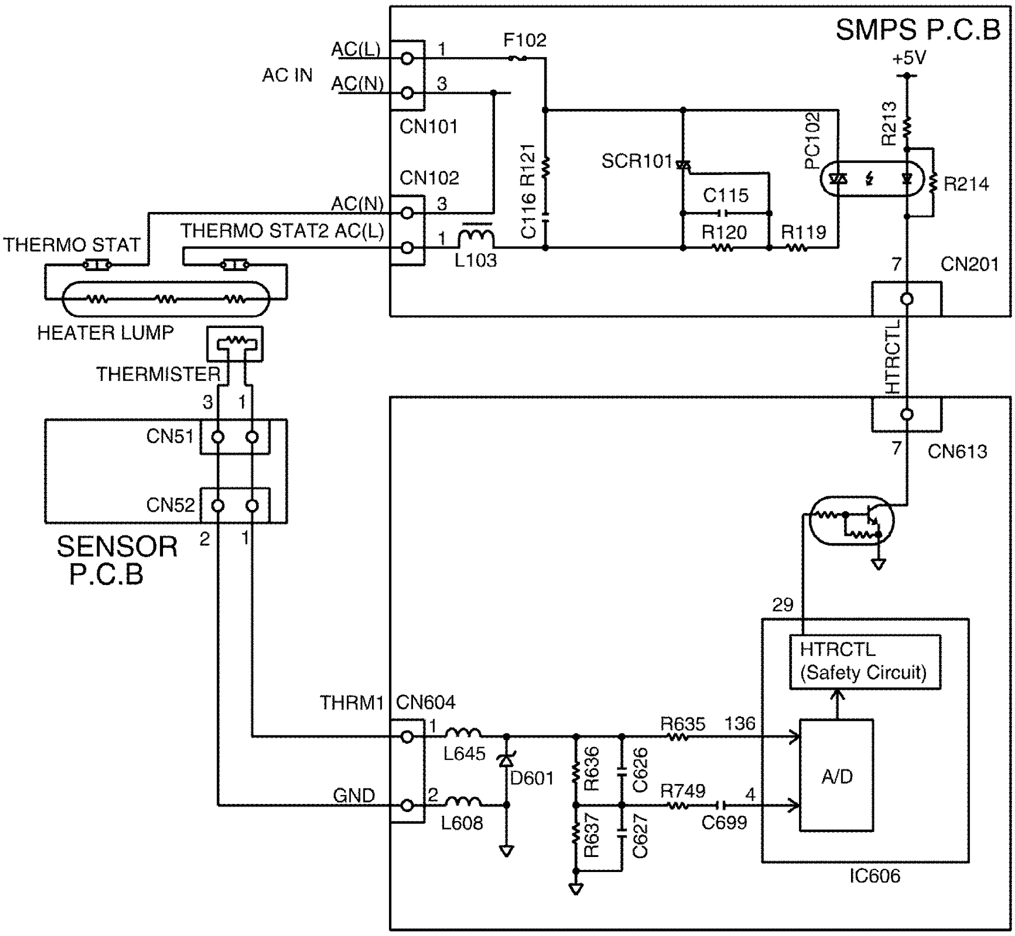


7.15. HEAT LAMP CONTROL CIRCUIT

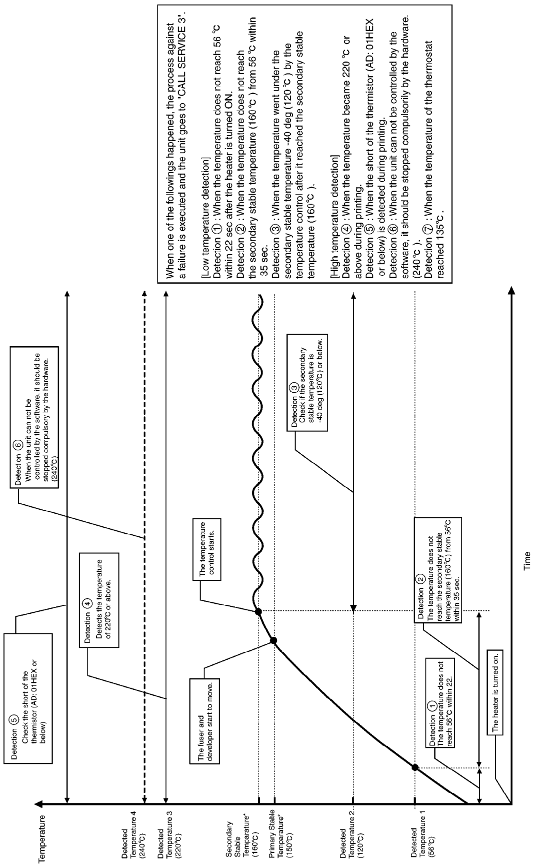
The temperature of the fixing part of the Fixing Unit is converted to a voltage by THERMISTOR and input to IC606-4pin. The heater turns ON/OFF the photo-coupler PC102 at the heater control port (IC606-29pin), and is turned ON/OFF at the triac SCR101. And two thermostats are set on

the AC line as the safety devices.

Circuit Diagram


SMPS P.C.B
AC IN
AC(L)
AC(N)
1
3
CN101
F102
+5V
R213
PC102
R214
C116 R121
SCR101
C115
R120
R119
CN102
AC(N)
3
THERMO STAT
THERMO STAT2 AC(L)
1
L103
7
CN201
HEATER LUMP
THERMISTER
HTRCTL
3
1
CN51
CN52
7
CN613
SENSOR
P.C.B
2
1
29
HTRCTL
(Safety Circuit)
THRM1
CN604
1
L645
D601
R636
C626
R635
136
A/D
GND
2
L608
R637
C627
R749
4
C699
IC606

1. **Control at Printing**
   - A. **After the printing signal is received, turn ON the heater.**
   - B. **After that, turn ON the motor at the Primary Stable Temperature (150°C).**
   - C. **After that, control at the Secondary Stable temperature (160°C), and feed papers.**



When one of the followings happened, the process against a failure is executed and the unit goes to "CALL SERVICE 3".

[Low temperature detection]
Detection ① : When the temperature does not reach 56 ℃ within 22 sec after the heater is turned ON.
Detection ② : When the temperature does not reach the secondary stable temperature (160℃) from 56 ℃ within 35 sec.
Detection ③ : When the temperature went under the secondary stable temperature -40 deg (120℃) by the temperature control after it reached the secondary stable temperature (160℃).

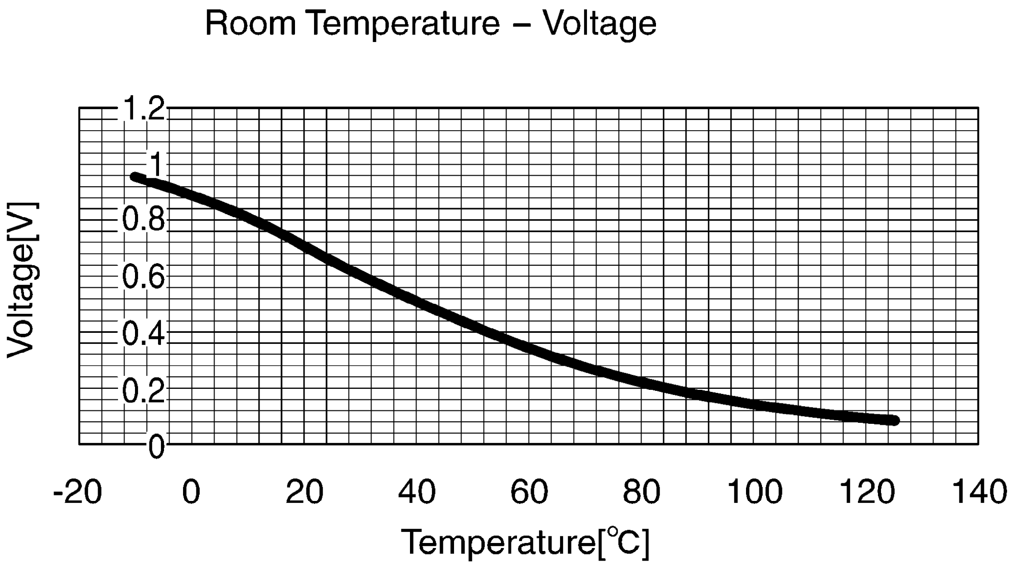
[High temperature detection]
Detection ④ : When the temperature became 220 ℃ or above during printing.
Detection ⑤ : When the short of the thermistor (AD: 01HEX or below) is detected during printing.
Detection ⑥ : When the unit can not be controlled by the software, it should be stopped compulsorily by the hardware. (240℃).
Detection ⑦ : When the temperature of the thermostat reached 135℃.

2. Safety Protection

A. 2 thermostats are provided with the unit, and the heater circuit is shut down when their surface temperatures became over 135°C.

B. The heater control circuit of IC606 has the built-in function that the software turns off the heater control automatically if the heater is not turned ON every a fixed time.

C. When the temperature became over 240°C, the heater control circuit of IC606 is turned off forcedly and system reset (IC606 pin 20 becomes Low) will be executed.

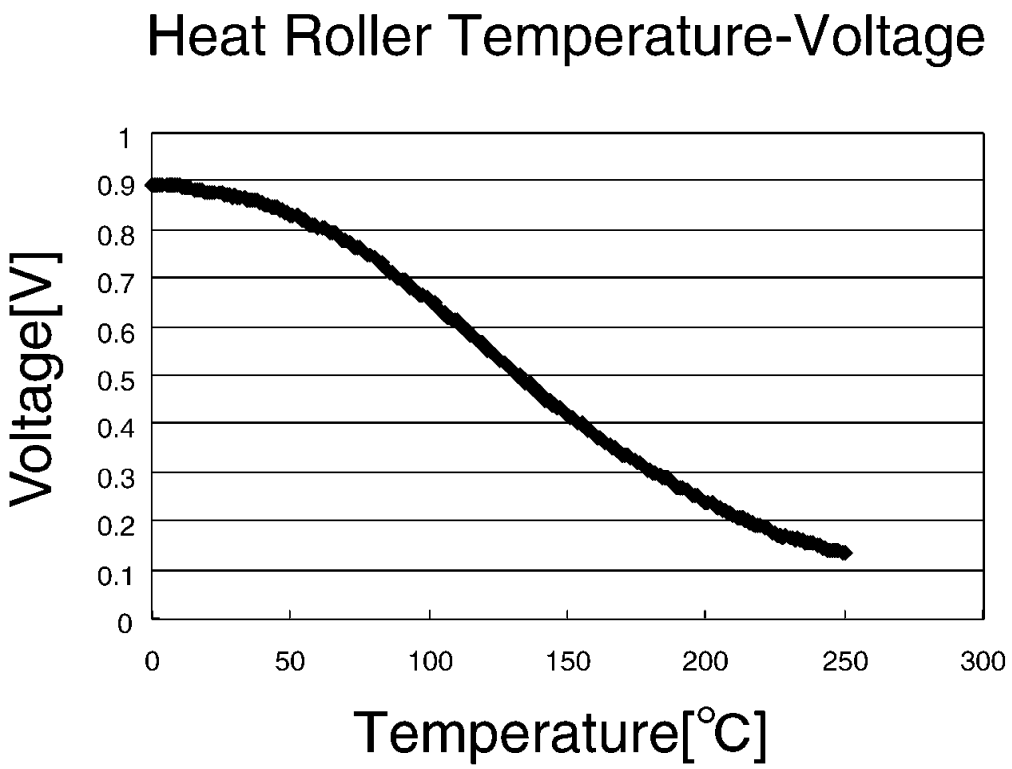


The correspondence readings between temperature measured by thermistor and HEX readings

Temperature(°C)	HEX reading	Temperature(°C)	HEX reading	Temperature(°C)	HEX r
-10	C2	36	41	82	12
-9	BF	37	40	83	12
-8	BC	38	3E	84	11
-7	B9	39	3C	85	11
-6	B5	40	3A	86	10
-5	B2	41	39	87	10
-4	AF	42	37	88	10
-3	AB	43	36	89	0F
-2	A8	44	34	90	0F
-1	A5	45	33	91	0E
0	A2	46	31	92	0E
1	9E	47	30	93	0E
2	9B	48	2F	94	0D
3	98	49	2D	95	0D
4	95	50	2C	96	0D
5	91	51	2B	97	0C
6	8E	52	2A	98	0C
7	8B	53	29	99	0C
8	88	54	27	100	0C
9	85	55	26	101	0B
10	82	56	25	102	0B
11	7F	57	24	103	0B
12	7C	58	23	104	0A
13	79	59	22	105	0A
14	76	60	21	106	0A
15	73	61	20	107	0A
16	70	62	20	108	09
17	6D	63	1F	109	09

Temperature(°C)	HEX reading	Temperature(°C)	HEX reading	Temperature(°C)	HEX r
18	6A	64	1E	110	09
19	68	65	1D	111	09
20	65	66	1C	112	09
21	63	67	1B	113	08
22	60	68	1B	114	08
23	5D	69	1A	115	08
24	5B	70	19	116	08
25	59	71	19	117	08
26	56	72	18	118	07
27	54	73	17	119	07
28	52	74	17	120	07
29	4F	75	16	121	07
30	4D	76	15	122	07
31	4B	77	15	123	07
32	49	78	14	124	06
33	47	79	14	125	06
34	45	80	13		
35	43	81	13		

Note:
The value is displayed on LCD at TEST FUNCTIONS () [#815].



The correspondence readings between temperature measured by fixing thermistor and HEX readings

Temperature(°C)	HEX reading	Temperature(°C)	HEX reading	Temperature(°C)	HEX r
0	E4	84	B8	168	58
1	E4	85	B7	169	57
2	E4	86	B6	170	56
3	E4	87	B5	171	56
4	E4	88	B4	172	55
5	E4	89	B3	173	54
6	E3	90	B2	174	53
7	E3	91	B1	175	52
8	E3	92	B0	176	51
9	E3	93	AE	177	50
10	E3	94	AD	178	4F
11	E2	95	AC	179	4E
12	E2	96	AB	180	4D
13	E2	97	AA	181	4C
14	E2	98	A9	182	4C
15	E1	99	A8	183	4B
16	E1	100	A7	184	4A
17	E1	101	A6	185	4A
18	E1	102	A5	186	49
19	E0	103	A3	187	48
20	E0	104	A2	188	47
21	E0	105	A1	189	46
22	E0	106	A0	190	45
23	DF	107	9E	191	44
24	DF	108	9D	192	44
25	DF	109	9C	193	43
26	DE	110	9C	194	42
27	DE	111	9A	195	41
28	DE	112	99	196	40
29	DD	113	98	197	40
30	DE	114	96	198	3F
31	DD	115	95	199	3E
32	DD	116	94	200	3D
33	DD	117	93	201	3C
34	DC	118	91	202	3C
35	DC	119	90	203	3B
36	DB	120	8F	204	3A
37	DB	121	8D	205	3A
38	DB	122	8D	206	39
39	DA	123	8B	207	38

Temperature(°C)	HEX reading	Temperature(°C)	HEX reading	Temperature(°C)	HEX r
40	DA	124	8A	208	37
41	D9	125	89	209	37
42	D9	126	88	210	36
43	D8	127	86	211	35
44	D7	128	85	212	35
45	D7	129	84	213	34
46	D6	130	82	214	33
47	D6	131	81	215	33
48	D5	132	80	216	32
49	D5	133	7F	217	32
50	D4	134	7D	218	31
51	D3	135	7C	219	30
52	D3	136	7B	220	30
53	D2	137	79	221	2F
54	D1	138	78	222	2F
55	D1	139	77	223	2E
56	D0	140	76	224	2D
57	CF	141	74	225	2D
58	CF	142	73	226	2C
59	CE	143	72	227	2C
60	CD	144	72	228	2A
61	CD	145	70	229	2B
62	CD	146	6F	230	2A
63	CC	147	6E	231	2A
64	CB	148	6D	232	29
65	CA	149	6C	233	2A
66	CA	150	6A	234	29
67	C9	151	69	235	29
68	C8	152	69	236	28
69	C7	153	68	237	28
70	C6	154	67	238	27
71	C5	155	66	239	27
72	C4	156	64	240	26
73	C3	157	63	241	26
74	C2	158	62	242	25
75	C2	159	61	243	25
76	C1	160	60	244	24
77	C0	161	5F	245	24
78	BF	162	5E	246	24
79	BE	163	5D	247	23
80	BD	164	5C	248	23
81	BC	165	5B	249	22
82	BB	166	5A	250	22
83	BA	167	59		

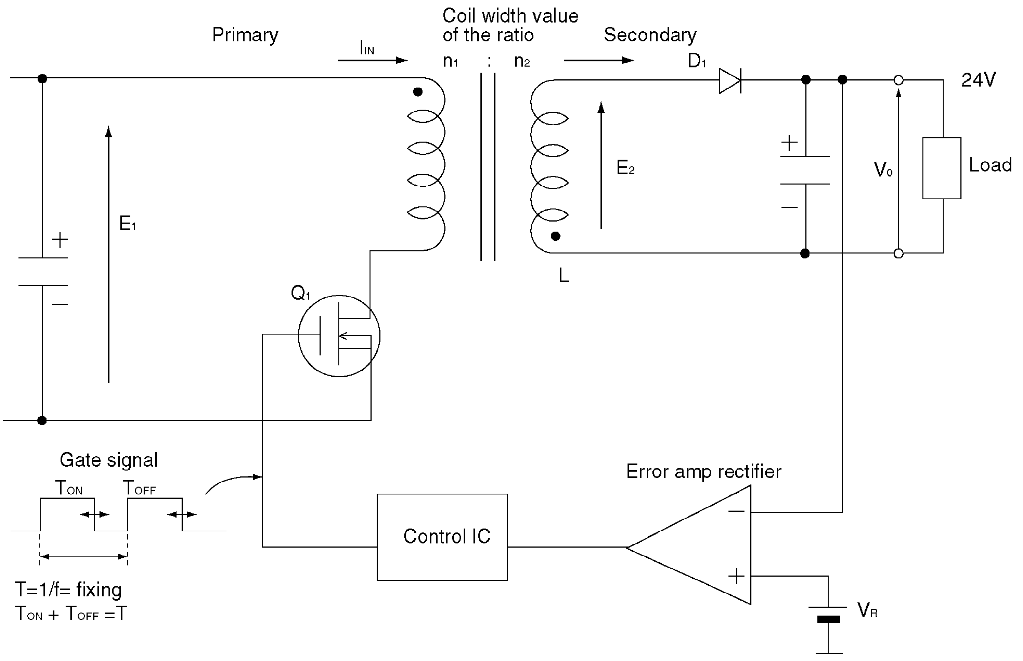
7.16. POWER SUPPLY BOARD SECTION

This power supply board uses the switching regulator method.

[Input Circuit]
The input current goes into the input rectifier circuit through the filter circuit. The filter circuit decreases the noise voltage and the noise electric field strength.

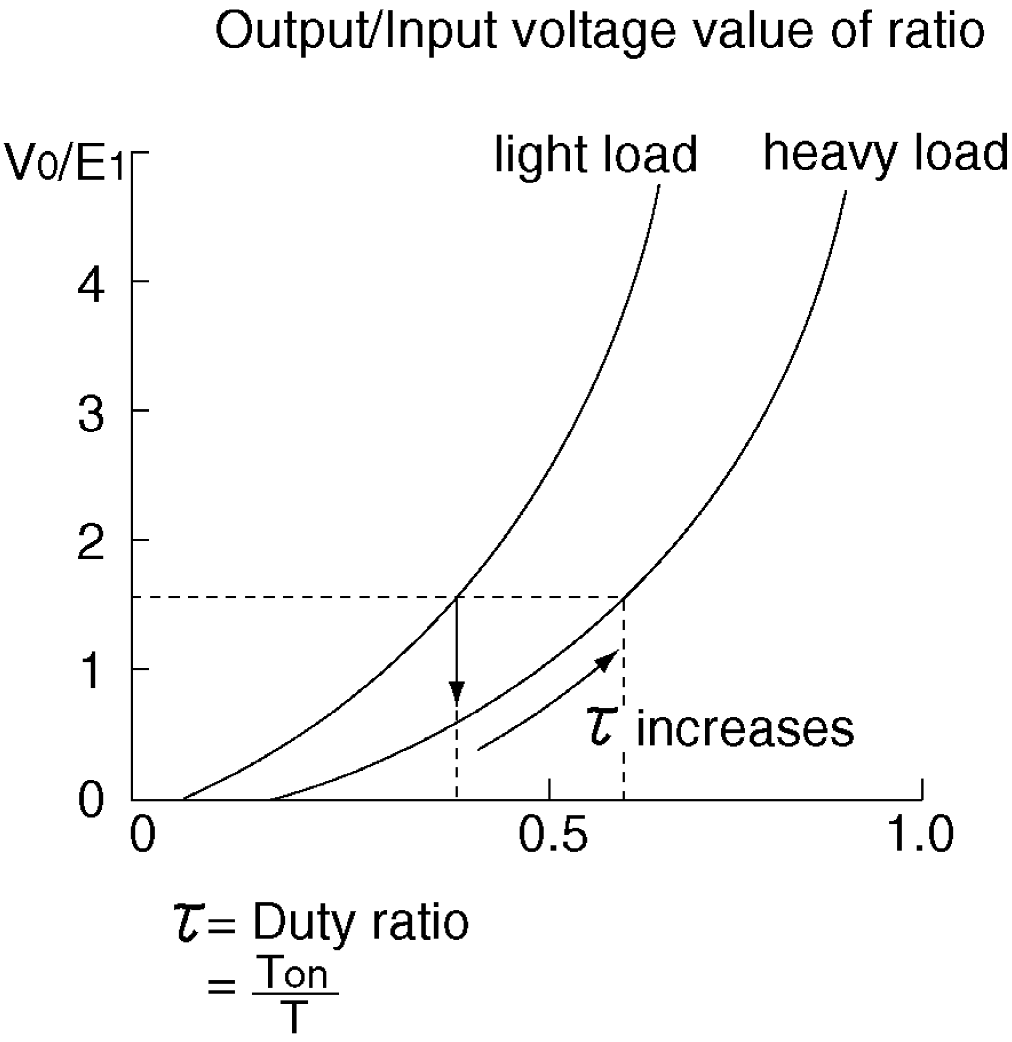
[Rectifier Circuit]
The input current is rectified by D101~ D104 and charges C106 to make DC voltage. Then it supplies power to the converter circuit.

[Kick-on voltage circuit]
Bias is applied to the Q101 gate via this circuit when the AC power is turned on and Q101 begins operating.


Primary
I_IN
Coil width value
of the ratio
n1 : n2
Secondary
D1
24V
E1
E2
Vo
Load
L
Q1
Gate signal
TON
TOFF
T=1/f= fixing
TON + TOFF =T
Control IC
Error amp rectifier
VR

The following is an overview of how the power supply unit is controlled.
The control method of this power supply unit is pulse width modulation.
When Q_1 is ON, the energy is charged in the transfer primary coil according to E_1. When Q_1 is OFF, the energy is output from the secondary transfer as follows.
L → D_1 → Load → L
Then the power is supplied to the Load. When Q_1 is ON, power is not output from the secondary side. The output voltage is fed back in the control IC according to the error amp rectifier. Then depending on how T_{ON} is controlled, stabilization occurs. Also, when the current load becomes

too large, in order to decrease the voltage output, the increase in τ is controlled and the output voltage is stabilized.
Therefore, basically the timing: Ton/Toff of Q1 controls the output voltage.



[Surge Absorber Circuit]
This circuit is for absorbing surge voltage generated by the transformer.

[Control Circuit and Detecting Circuit]
The control circuit amplifies the output with increased voltage detected in the error detecting circuit. Then it drives the main transistor.
In this power supply, the duty ratio is defined by changing the ON period of the main transistor. This is shown as follows.
When the output voltage of the 24V circuit increases, the current of the photo coupler PC101 increases, the pulse width of the output control IC becomes narrower and the ON period of Q101 becomes shorter.

[Over Current Limiter (O.C.L)]
The highest drain current (Q101) is limited by a limiter circuit (IC101) of 24V. The 24V output is limited by this circuit.

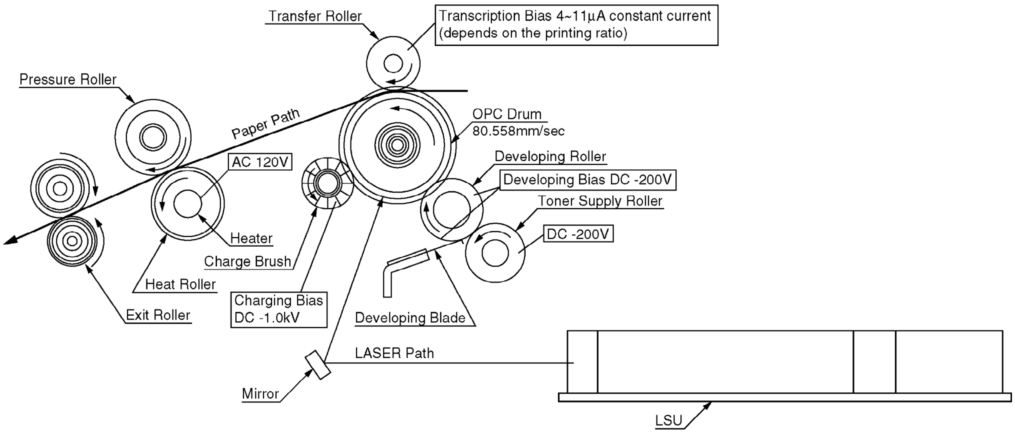
[Over Voltage Circuit]
If the 24V output increases because the error detecting circuit or control circuit is broken, IC101 will recognize this signal and output becomes 0V.

Dummy load method (to quickly check the power supply output)
Refer to POWER SUPPLY BOARD SECTION,] ().

8. REFERENCE MATERIALS DATA

8.1. PRINTING OPERATION PRINCIPLE

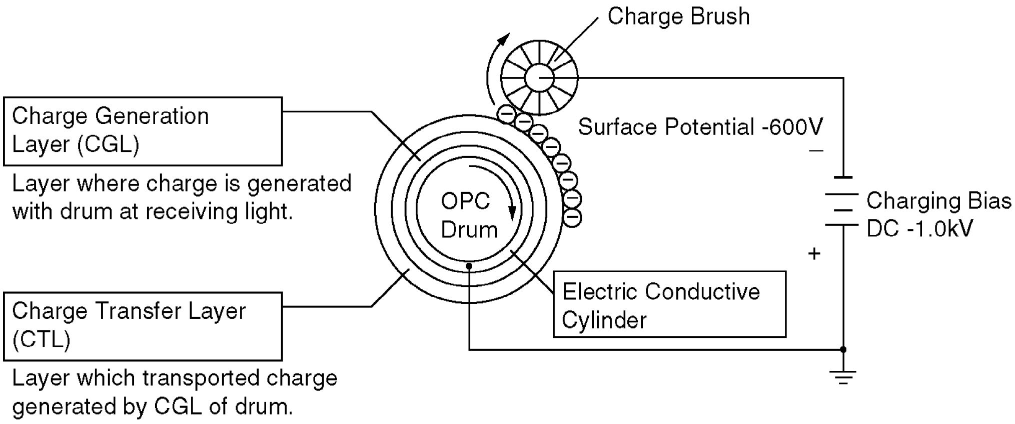
8.1.1. PROCESS CHART AND PROCESS BIAS


Transfer Roller
Transcription Bias 4~11µA constant current (depends on the printing ratio)
Pressure Roller
Paper Path
OPC Drum
80.558mm/sec
Developing Roller
Developing Bias DC -200V
Toner Supply Roller
DC -200V
AC 120V
Heater
Charge Brush
Heat Roller
Charging Bias DC -1.0kV
Developing Blade
Exit Roller
LASER Path
Mirror
LSU

8.1.2. CHARGING

Charging is the stage that keeps the surface of the sensitive drum a fixed electric potential. The sensitive drum is the Organic Photo Conductor (OPC), which is a electric conductive cylinder whose surface is covered with the Charge Generation Layer (CGL) and Charge Transfer Layer (CTL).
When the charging bias (DC -1.0 kiev) is added and the minus charge is supplied to the charge brush while charging, the whole surface potential of the drum is -600V.

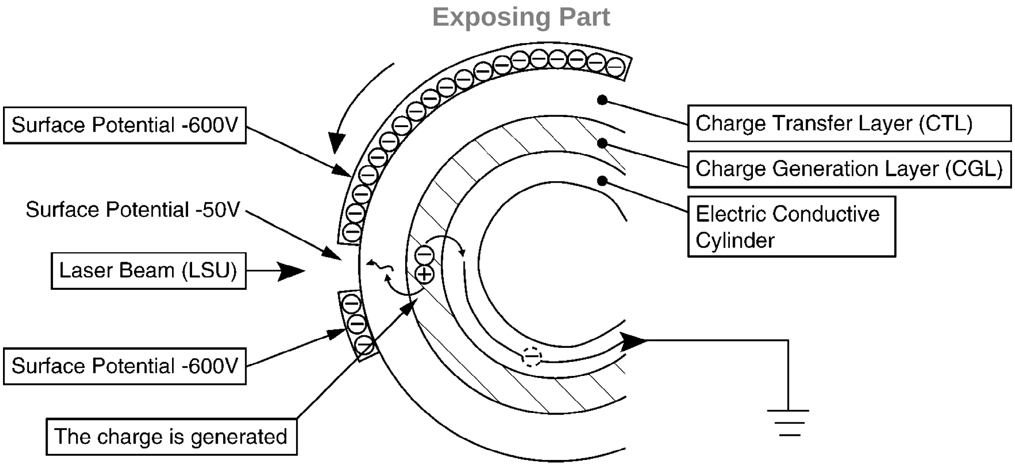
Charging Part


Charge Brush
Charge Generation Layer (CGL)
Layer where charge is generated with drum at receiving light.
Surface Potential -600V
OPC Drum
Charging Bias DC -1.0kV
Electric Conductive Cylinder
Charge Transfer Layer (CTL)
Layer which transported charge generated by CGL of drum.

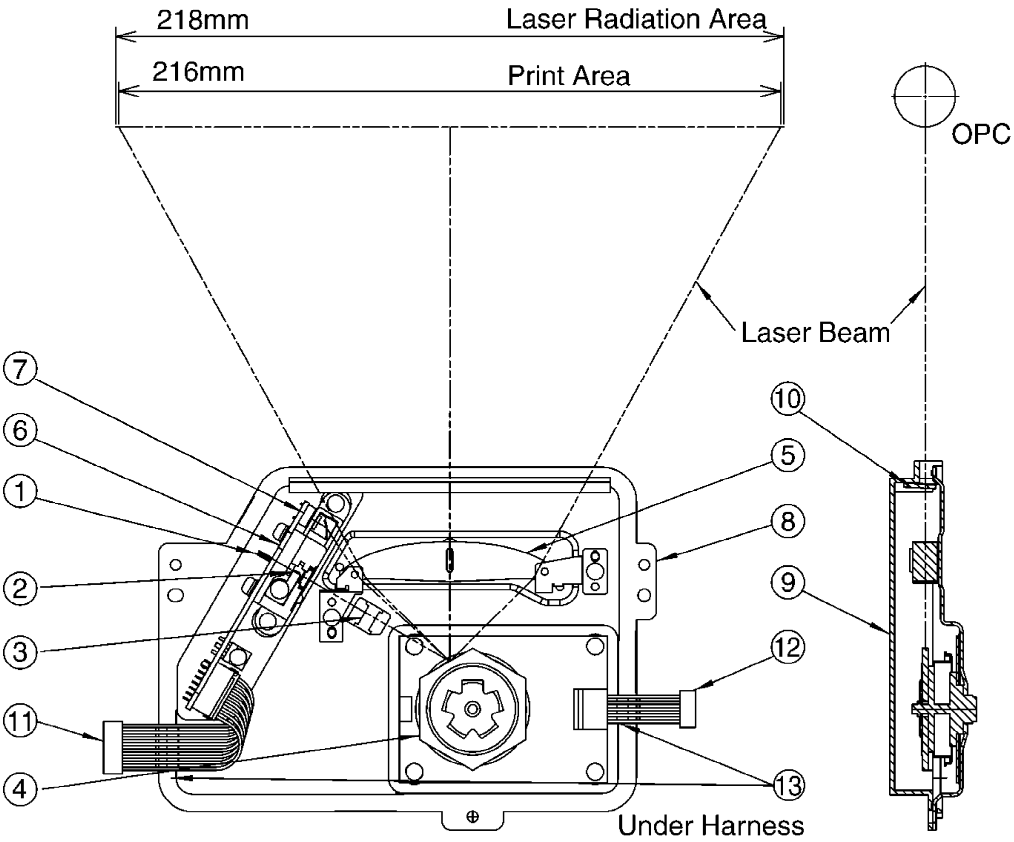
8.1.3. EXPOSING

When the drum which is charged with the fixed electric charge is irradiated by the laser beam, the plus charge and minus charge are generated at the Charge Generation Layer. Passing through the Charge Transfer Layer which conducts the plus charge, the minus-charged drum's surface is neutralized to be skipped. Then the minus charge goes to the ground from the electric conductive cylinder. Consequently the charge of the part which is not exposed remains as it is, and the electric potential of the scanned part changes.

At that time an invisible image is created on the drum.


Exposing Part
Surface Potential -600V
Surface Potential -50V
Laser Beam (LSU)
Surface Potential -600V
The charge is generated
Charge Transfer Layer (CTL)
Charge Generation Layer (CGL)
Electric Conductive Cylinder

8.1.4. LASER SCANNING UNIT LOCATIONS



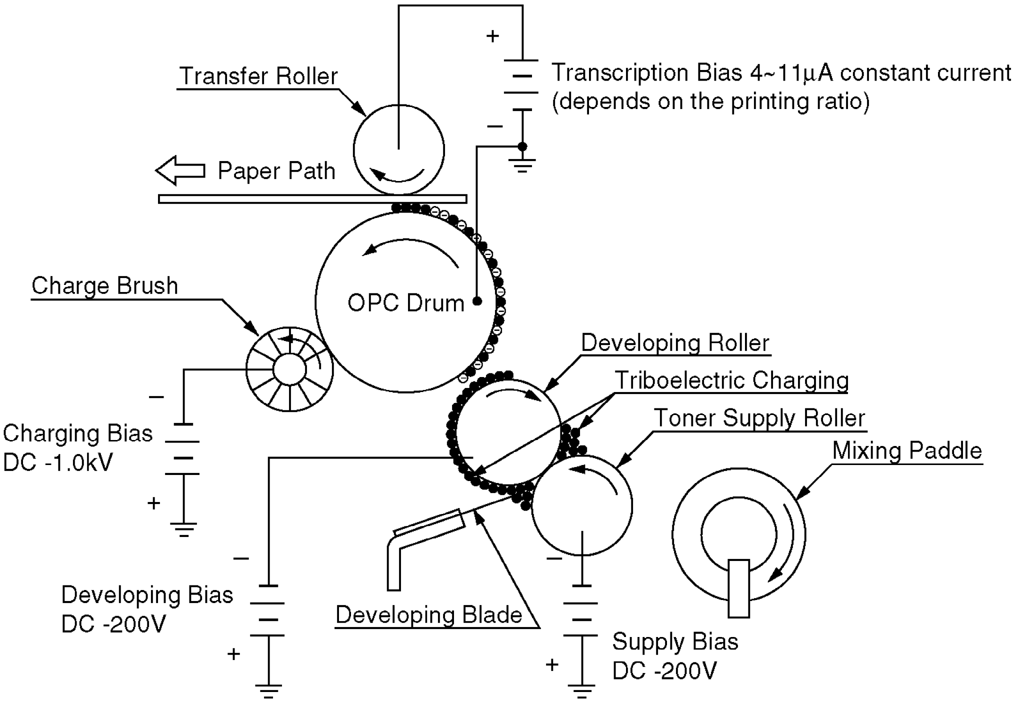
	Parts Name		Parts Name
1	Laser Diode	8	Frame
2	Collimator Lens	9	Cover
3	Cyrindorical Lens	10	Cover Glass
4	Polygon Motor Unit	11	LD Harness
5	f θ Lens	12	Motor Harness
6	LD Driving Circuit	13	Sponge
7	Pin Photodiode		

8.1.5. DEVELOPING AND TRANSCRIPTION

The developing is the stage that the OPC drum with an invisible image is changed to visible by the toner. The developer consists of mixing paddle, toner supply roller, developing roller, developing blade and OPC drum. The bias voltage is added to the developing roller (DC -200V) and toner supply roller (DC -200V). Firstly the toner is mixed up in the mixing paddle and minus-charged by triboelectricity, then led to the toner supply roller. Secondly the potential difference causes to send the toner to the developing roller from the toner supply roller. The supplied toner to the developing roller is kept to a certain layer thickness by the developing blade and also it is charged by triboelectricity. Consequently the toner is transferred to the surface of the exposed OPC drum by the potential difference between the developing roller and OPC drum's surface.

The transfer is the stage that the created image on the OPC drum is transferred to the paper. When the transfer roller is plus-charged with the image, the minus-charged toner particles are gathered on the surface of the drum and transferred to the paper.

Developing and Transcription Part


Transfer Roller
Transcription Bias 4~11µA constant current
(depends on the printing ratio)
Paper Path
Charge Brush
OPC Drum
Developing Roller
Triboelectric Charging
Toner Supply Roller
Mixing Paddle
Charging Bias
DC -1.0kV
Developing Bias
DC -200V
Developing Blade
Supply Bias
DC -200V

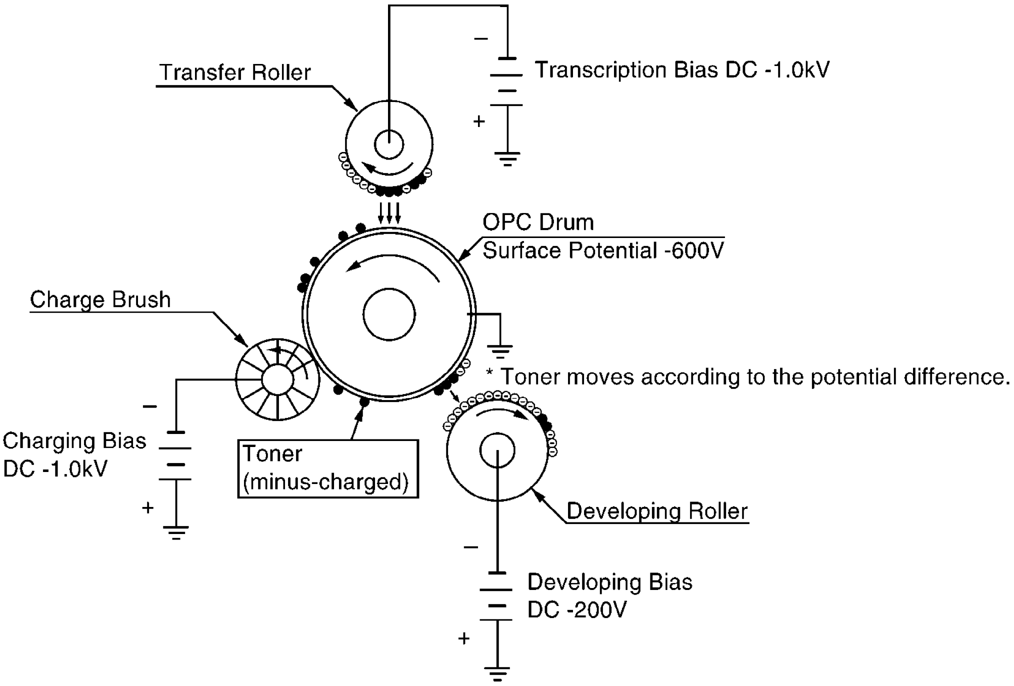
The values of developing bias and supply bias are different from the ones described in the Service Manual for FL501.
The biases output from the unit of FL501,FLM551 and FLB751(FLB750) have the same voltage. However, the developing device of FA78X(FA78A) converts the developing and supply biases inside the developing device to improve the image quality.

	FA77X(FA77A) developing device	**FA78X(FA78A) developing device**	**FA84X(FA84A/FA84E) developing device**
Developing bias	**-350V**	**-180V**	**-200V**
Supply bias	**-550V**	**-350V**	**-200V**

8.1.6. CLEANING

The toner attached to the surface of the OPC drum is transferred to the paper at the transcription stage, but a part of the toner remains. The cleaning is the stage that cleans the remain toner after the transcription stage. The remain toner on the drum and the toner which was attached to the place where the laser beam didn't scan are gathered to the developing roller to be used again. When no paper is supplied, the transfer roller is minus-charged to eliminate the minus-charged toner.

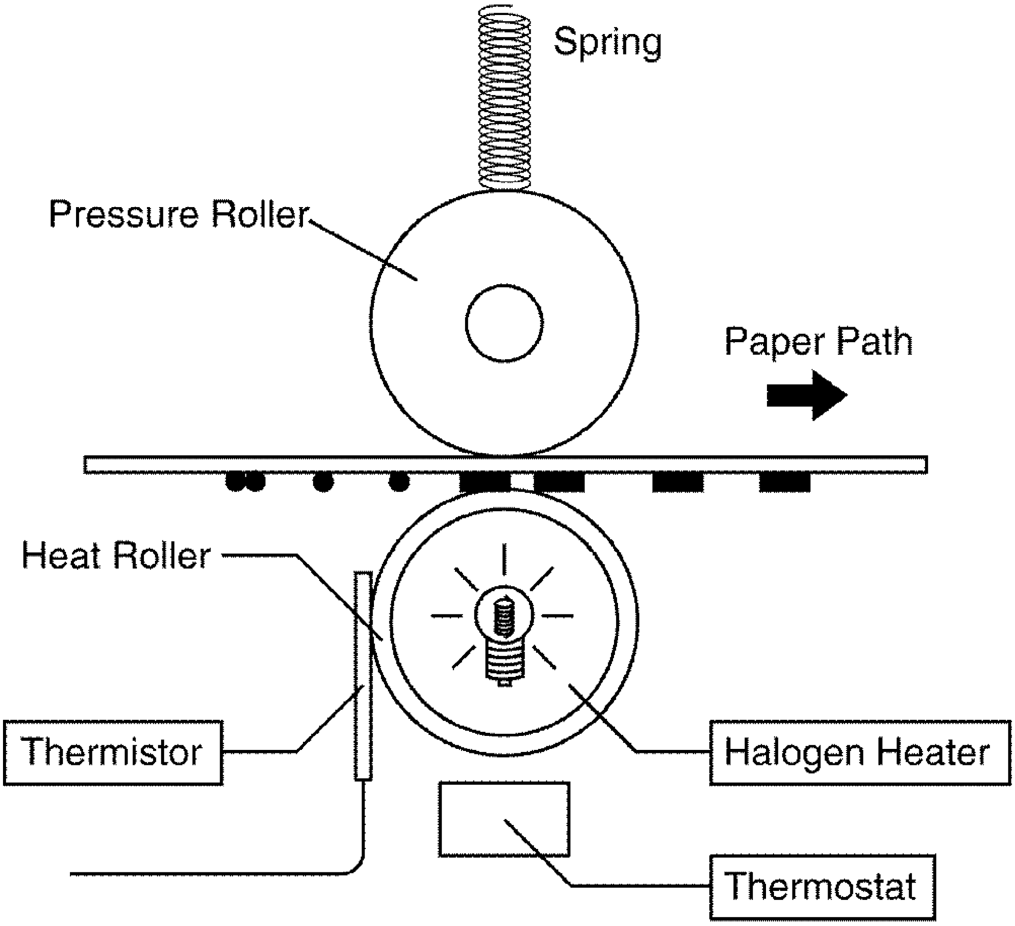
Cleaning Part


Transfer Roller
Transcription Bias DC -1.0kV
OPC Drum
Surface Potential -600V
Charge Brush
* Toner moves according to the potential difference.
Charging Bias
DC -1.0kV
Toner
(minus-charged)
Developing Roller
Developing Bias
DC -200V
–
+

8.1.7. FIXING

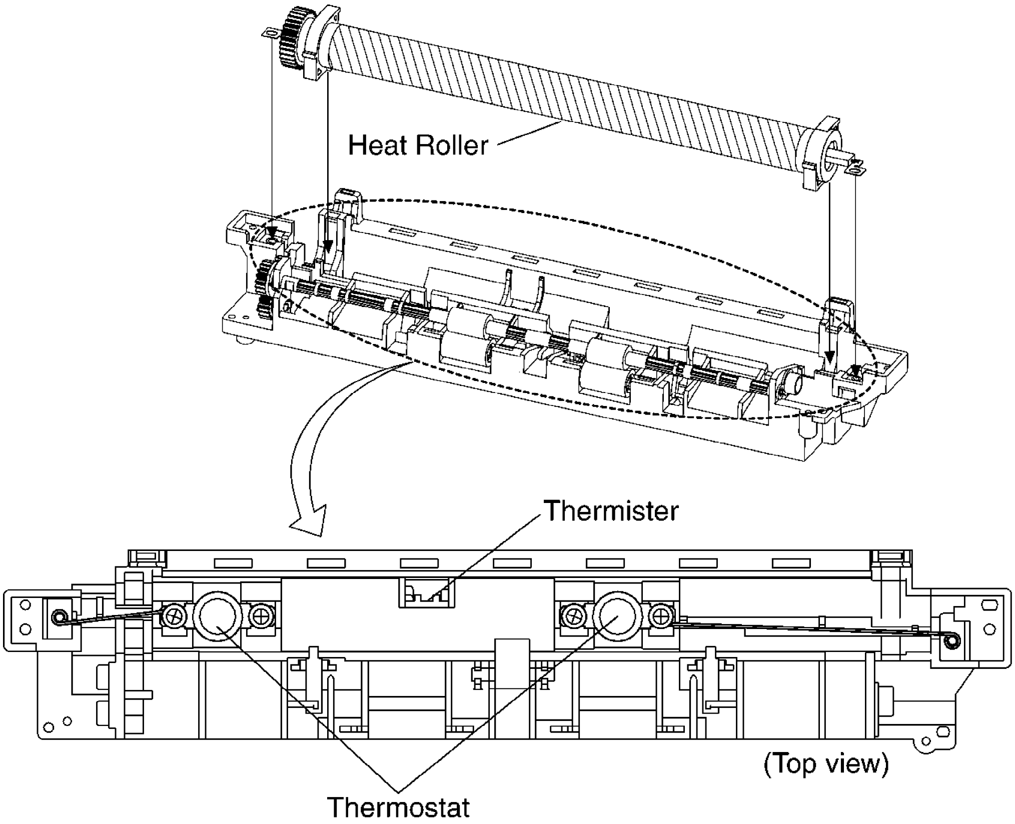
On the process of the transfer, the transferred toner is weakly attached on the paper. Fixing means the process to fix the toner on the paper permanently. The fixing part melts the toner at the high temperature using the halogen heater. The toner is fixed on the paper by the heat and pressure through the fixing part with the image. The surface of the heat roller is rosined by Teflon and lubricated to prevent from attaching the toners. The press roller is made of silicon, and its spring compresses the melted toner.

Fixing Part

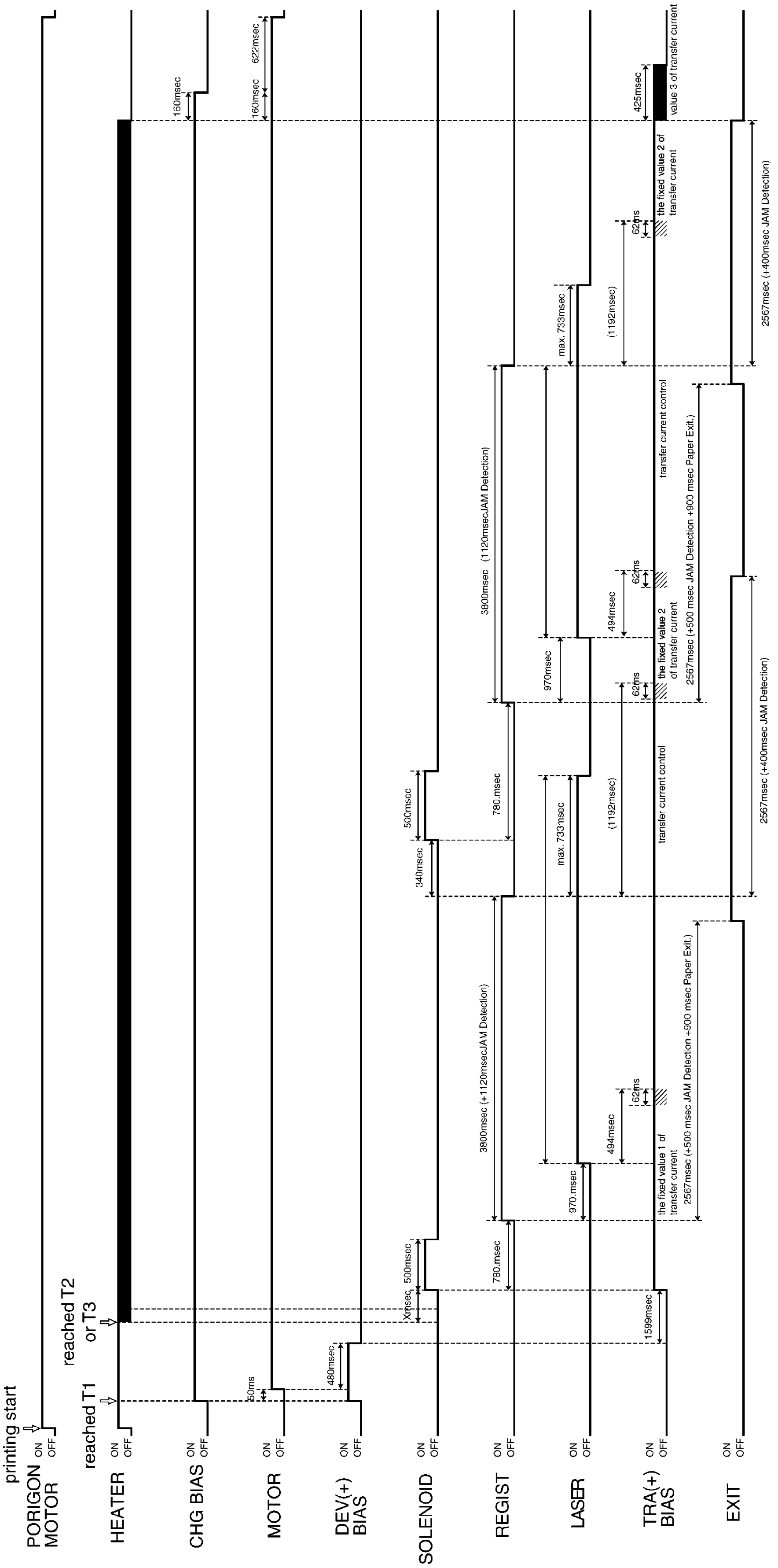

Spring
Pressure Roller
Paper Path
Heat Roller
Thermistor
Halogen Heater
Thermostat

The fixing part becomes high temperature, so the thermistor and the thermal fuse are provided.

1. **Thermistor**
   The thermistor touches the heat roller and check the temperature to feed back to the control circuit. The surface temperature should be kept 160 °C while printing.
2. **Thermostat**
   The thermostat takes the same role with the thermal fuse. The thermostat is located near the heat roller, and it turns OFF the power when the temperature around the thermostat becomes over 135°C.


Heat Roller
Thermister
(Top view)
Thermostat

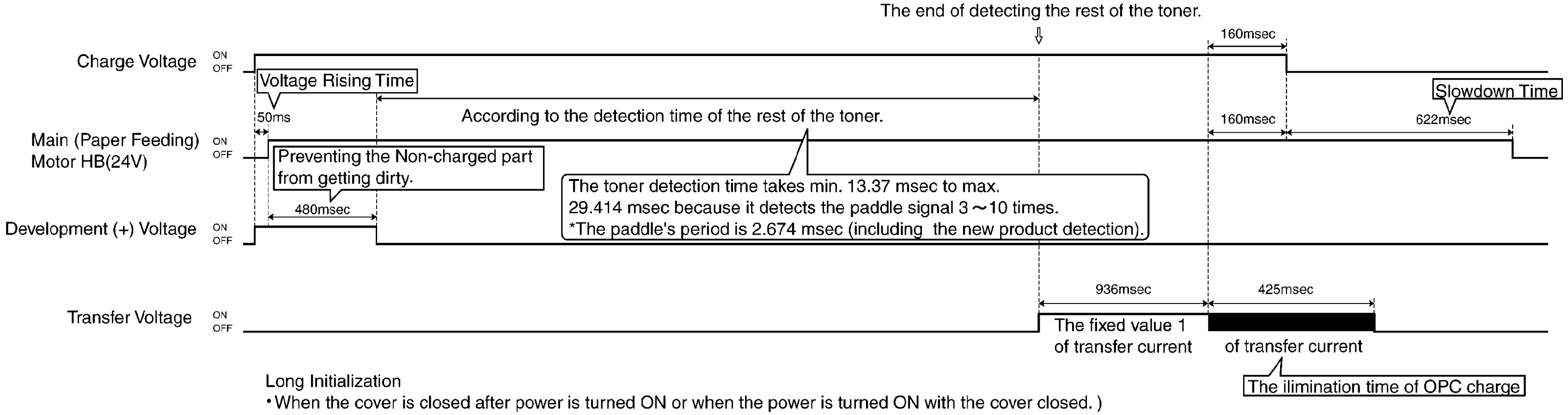
8.1.8. TIMING CHART (When Printing Two Sheets of Paper) BASIC


printing start
reached T1
reached T2 or T3
PORIGON MOTOR
HEATER
CHG BIAS
MOTOR
DEV(+) BIAS
SOLENOID
REGIST
LASER
TRA(+) BIAS
EXIT
ON
OFF
50ms
480msec
Xmsec
500msec
340msec
780msec
780.msec
1599msec
970.msec
970msec
3800msec (+1120msecJAM Detection)
3800msec (1120msecJAM Detection)
494msec
62ms
max. 733msec
(1192msec)
the fixed value 1 of transfer current
the fixed value 2 of transfer current
transfer current control
2567msec (+500 msec JAM Detection +900 msec Paper Exit.)
2567msec (+400msec JAM Detection)
160msec
622msec
425msec
value 3 of transfer current

s

8.1.9. Timing Chart [Initializing (Long)]

8.1.10. Timing Chart (when the registration sensor is turned OFF then ON

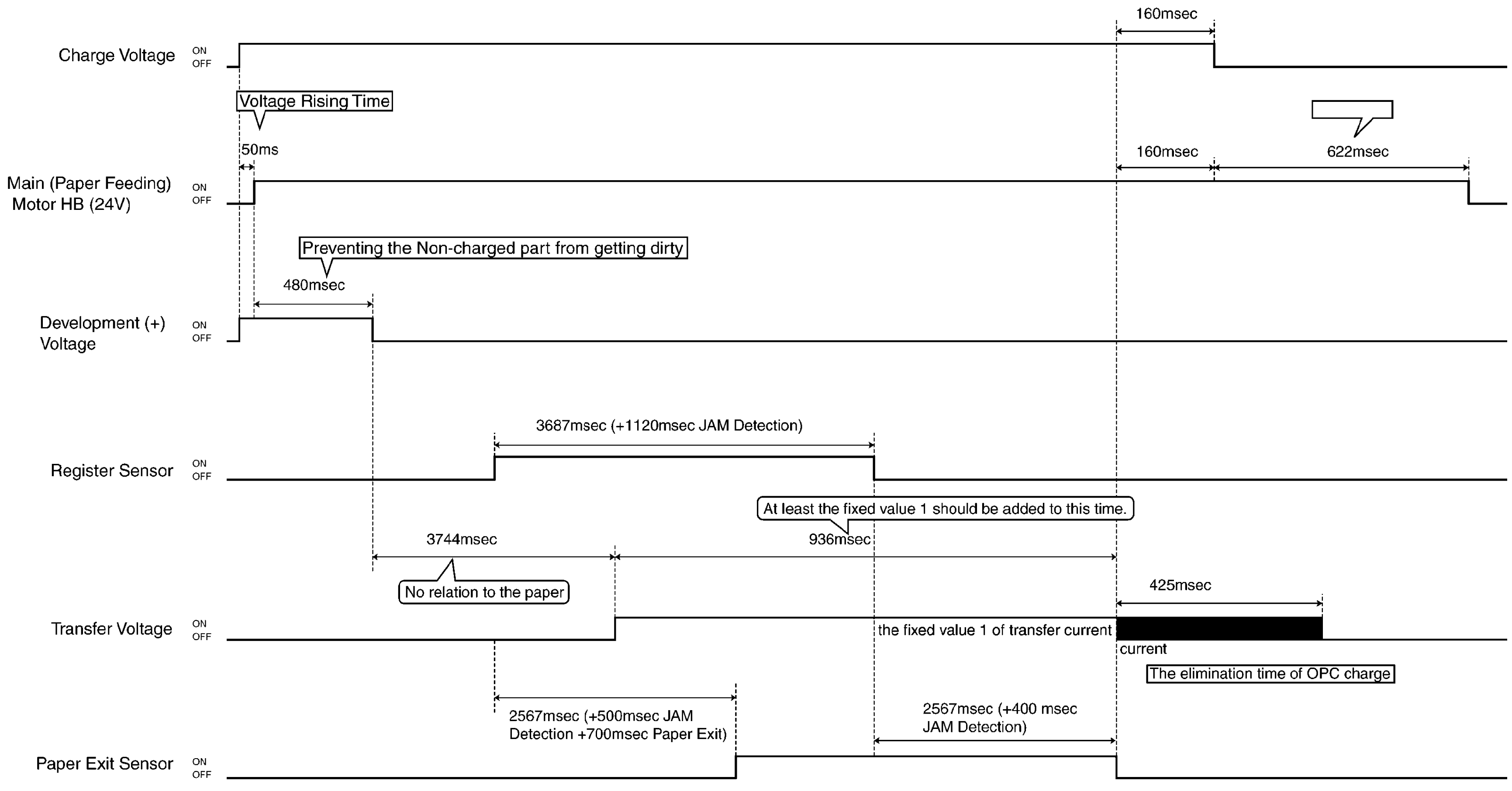


Long Initialization
- When the cover is closed after power is turned ON or when the power is turned ON with the cover closed.)
- When the developer is removed. (When the cover is closed after the developer is removed.)
- When the cover is closed after the toner becomes LOW.
- When the cover is closed after the Jam is released.
- After FAILED PICK UP is released. The initialization of the pick up roller position
- Aging: Once/day

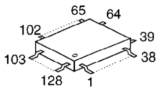
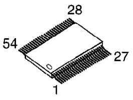
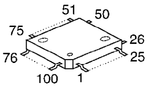
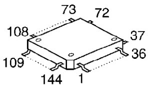
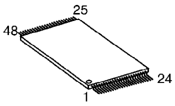
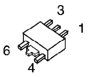
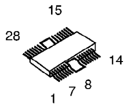
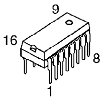
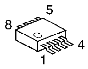
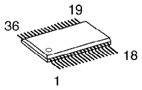
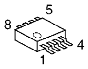
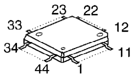
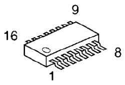
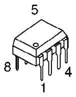
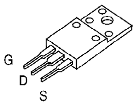
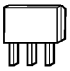
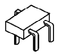
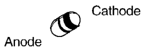
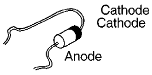
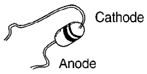
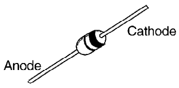
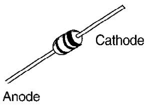
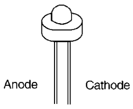
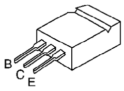
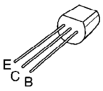
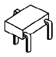
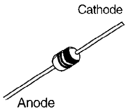
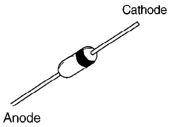
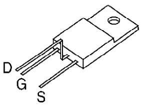
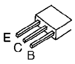
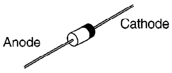
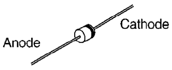
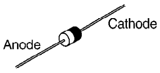
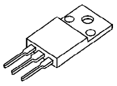
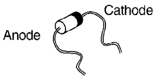
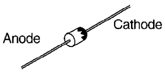
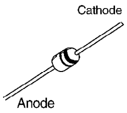
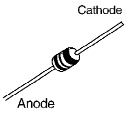
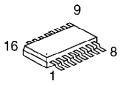
* In case that the abnormal paddle signal is detected during initialization,
the motor is forced to stop without completion processing,
on the other hand when it is detected during printing the process will be completed as usual.

To prevent the unit from being destructed by the OPC transfer voltage

during initializing)


Charge Voltage
ON
OFF
Main (Paper Feeding) Motor HB (24V)
ON
OFF
Development (+) Voltage
ON
OFF
Register Sensor
ON
OFF
Transfer Voltage
ON
OFF
Paper Exit Sensor
ON
OFF
160msec
Voltage Rising Time
50ms
160msec
622msec
Preventing the Non-charged part from getting dirty
480msec
3687msec (+1120msec JAM Detection)
At least the fixed value 1 should be added to this time.
3744msec
936msec
No relation to the paper
425msec
the fixed value 1 of transfer current
current
The elimination time of OPC charge
2567msec (+500msec JAM Detection +700msec Paper Exit)
2567msec (+400 msec JAM Detection)

8.2. TERMINAL GUIDE OF THE ICs TRANSISTORS AND DIODES

 65 64 102 39 103 38 128 1 PFVIR676811	 C3ABPG000102	 51 50 75 26 76 25 100 1 C1CB00001566	 73 72 108 37 109 36 144 1 C1CB00001551	 PFWIFL511E
 C0DBFGD00012	 C0GBH0000015	 PFVIT2003APS	 C0JBAR000386	 AN6383SB
 PQVINJM4558M/ PQVIMC34119D	 23 22 33 12 34 11 44 1 C1ZBZ0002089	 AN6742S	 PFVIFA5317P	 PFVIPQ05RD11
 PQVDNNCD56DT	 2SB1322	 PQVTDTC143E/ 2SB1197K/ PQVTD143Z106/ 2SD1819A	 Cathode Anode PQVDRLS73T/ PFVDRMRLS245	 Cathode Cathode Anode B0JAME000005
 Cathode Anode MA7160	 Cathode Anode PFVDRMRLS245/ PQVDRLS73T/ 1SS133	 Cathode Anode MA4056	 Anode Cathode PQVDSLR325MC/ PQVDR325CA47	 2SD2137A
 2SA1699	 2SB709A	 Cathode Anode PFVDRD62ESAB	 Cathode Anode PFVDRD150EB	 2SK2543
 2SC1740S	 Cathode Anode h:PFVDDHM3FJ60/ PFVDDHM3M20/ PFVDGPP20JT3	 Cathode Anode PFVDERA1504	 Cathode Anode PFVD05NU42/ PSVD10ELS4	 PFVDYG901C2R
 Cathode Anode PFVD21DQ04	 Cathode Anode PFVDERA9102	 Cathode Anode MA4300/MA4180	 Cathode Anode MA4062N	 C1CB00001637

8.3. HOW TO REPLACE THE FLAT PACKAGE IC

Even if you do not have the special tools (for example, a spot heater) to remove the Flat IC, with some solder (large amount), a soldering iron and a cutter knife, you can easily remove the ICs

that have more than 100 pins.

8.3.1. PREPARATION

8.3.1.1. For Power Supply Board

- SOLDER

Sparkle Solder 115A-1, 115B-1 OR Almit Solder KR-19, KR-19RMA

- Soldering iron

Recommended power consumption is between 30 W to 40 W.
Temperature of Copper Rod 662 ± 50°F (350 ± 10°C)
(An expert may handle a 60~80 W iron, but a beginner might damage the foil by overheating.)

- Flux

HI115 Specific gravity 0.863
(Original flux should be replaced daily.)

8.3.1.2. For P.C.Board with “PbF” marking

- PbF (: Pb free) Solder

- Soldering Iron

Tip Temperature of 700°F ± 20°F (370°C ± 10°C)
Note: We recommend a 30 to 40 Watt soldering iron. An expert may be able to use a 60 to 80 Watt iron where someone with less experience could overheat and damage the PCB foil.

- Flux

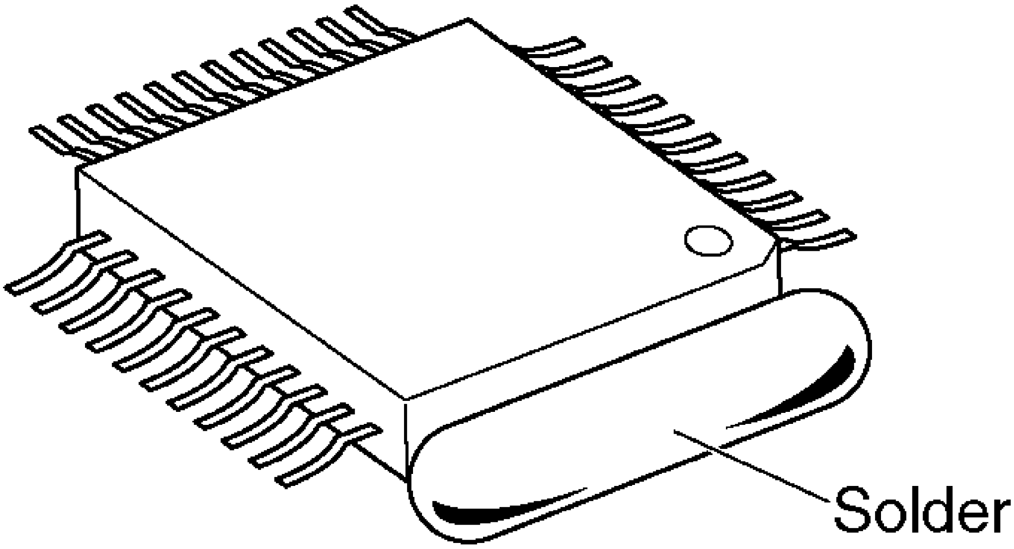
Recommended Flux: Specific Gravity → 0.82.
Type → RMA (lower residue, non-cleaning type)

Note: See ABOUT LEAD FREE SOLDER (PbF: Pb free) ().

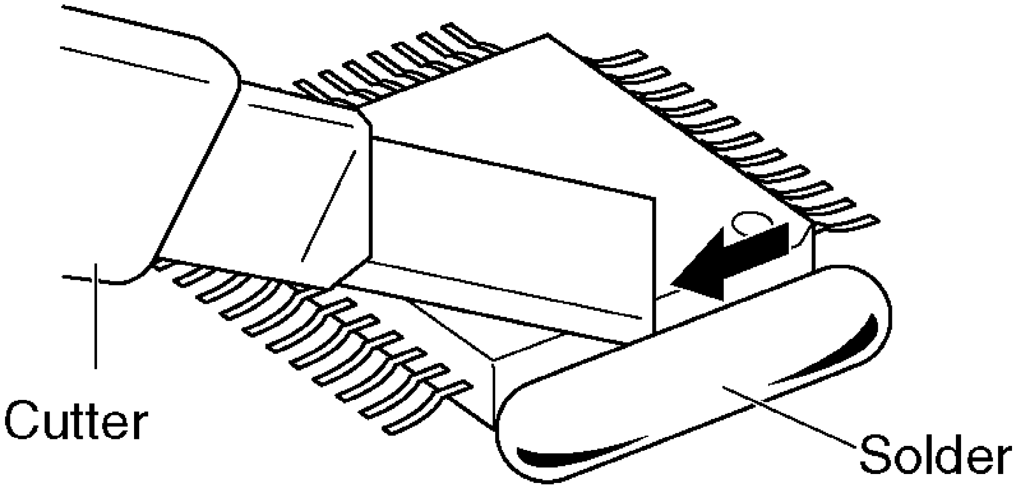
8.3.2. FLAT PACKAGE IC REMOVAL PROCEDURE

1. Put plenty of solder on the IC pins so that the pins can be completely covered.

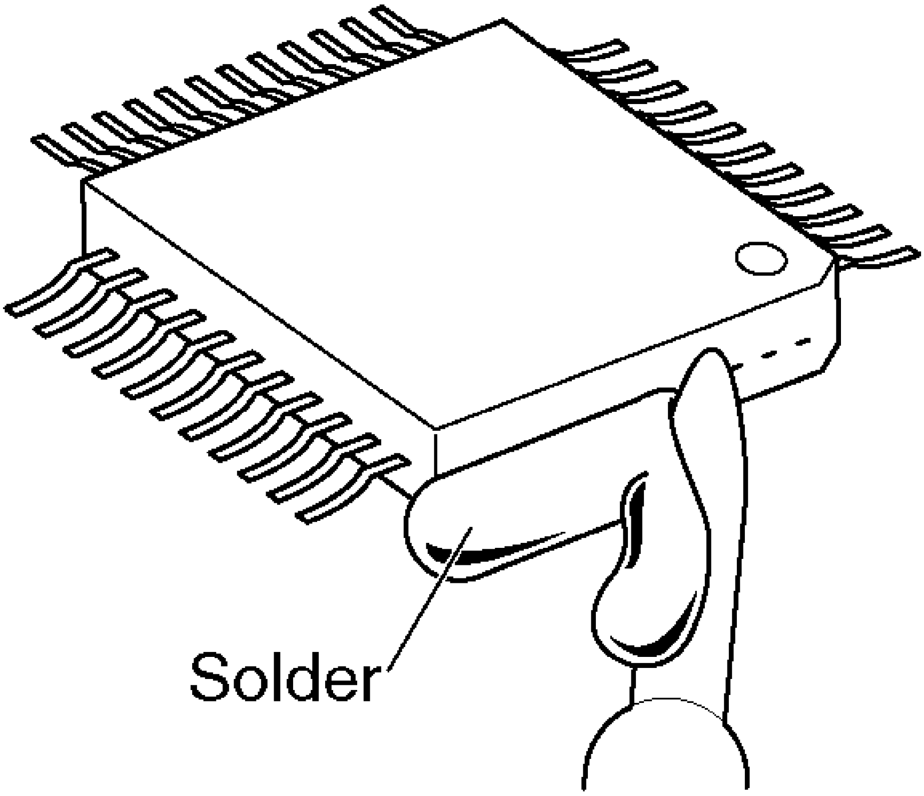
Note:
If the IC pins are not soldered enough, you may give pressure to the P.C. board when cutting the pins with a cutter.



2. Make a few cuts into the joint (between the IC and its pins) first and then cut off the pins thoroughly.


Cutter
Solder

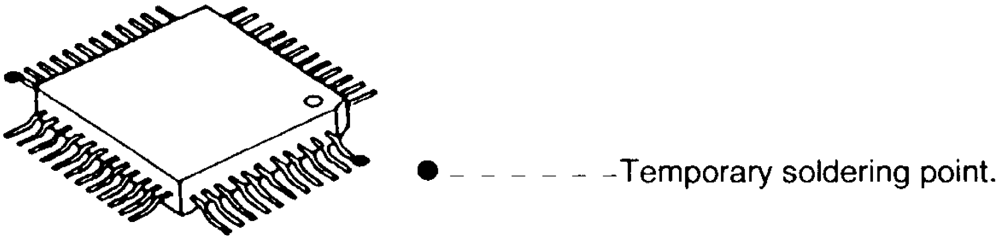
3. While the solder melts, remove it together with the IC pins.



When you attach a new IC to the board, remove all solder left on the land with some tools like a soldering wire. If some solder is left at the joint on the board, the new IC will not be attached properly.

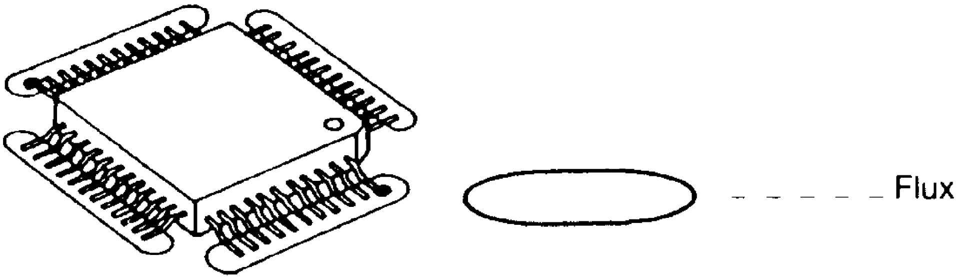
8.3.3. FLAT PACKAGE IC INSTALLATION PROCEDURE

1. **Temporarily fix the FLAT PACKAGE IC, soldering the two marked pins.**

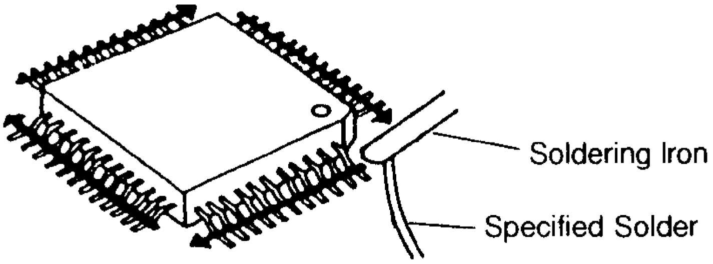


***Check the accuracy of the IC setting with the corresponding soldering foil.**

2. **Apply flux to all pins of the FLAT PACKAGE IC.**

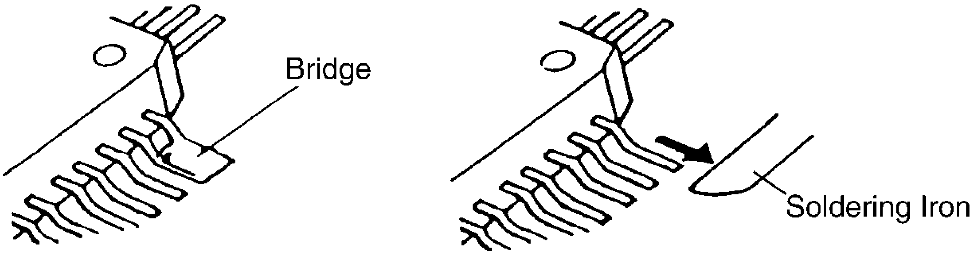


3. Solder the pins, sliding the soldering iron in the direction of the arrow.



8.3.4. BRIDGE MODIFICATION PROCEDURE

1. Lightly resolder the bridged portion.
2. Remove the remaining solder along the pins using a soldering iron as shown in the figure below.

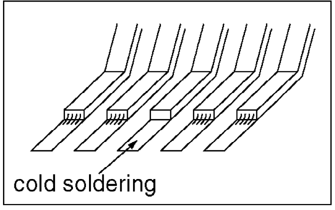


8.4. DIGITAL BOARD SECTION

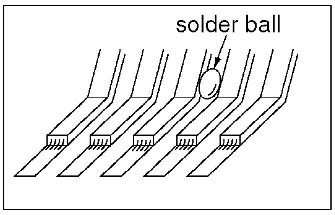
When the unit fails to boot up the system, take the troubleshooting procedures very carefully. It may have a serious problem.
The symptom: No response when the power is turned on. (No LCD display, and keys are not accepted.)
The first step is to check the power source. If there is no problem with the power supply unit, the problem may lie in the digital unit (main board).
As there are many potential causes in this case (ASIC, DRAM, etc.), it may be difficult to specify what you should check first. If a mistake is made in the order of checks, a normal part may be determined faulty, wasting both time and money.
Although the tendency is to regard the problem as a serious one (IC malfunction, etc.), usually

most cases are caused by solder faults (poor contact due to a tunnel in the solder, signal short circuit due to solder waste).

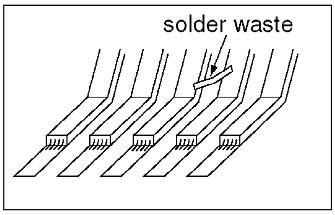
SMT(Surface Mount Type) PARTS



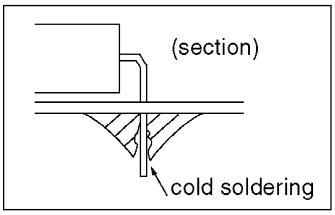
SMT PARTS



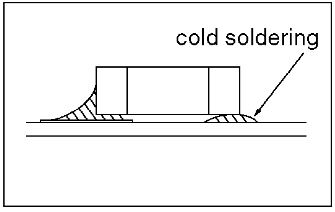
SMT PARTS



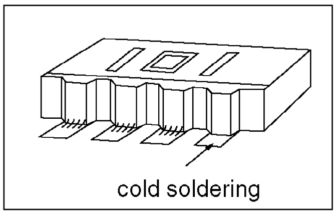
LEADED PARTS



CHIP PARTS (section)



RESISTOR ARRAY



Note:

1. **Electrical continuity may have existed at the factory check, but a faulty contact occurred as a result of vibration, etc., during transport.**
2. **Solder waste remaining on the board may get caught under the IC during transport, causing a short circuit.**

Before we begin mass production, several hundred trial units are produced at the plant, various tests are applied and any malfunctions are analyzed. (In past experiences, digital IC (especially, DRAM and ROM) malfunctions are extremely rare after installation in the product.)
This may be repaired by replacing the IC, (DRAM etc.). However, the real cause may not have been an IC malfunction but a soldering fault instead.
Soldering faults difficult to detect with the naked eye are common, particularly for ASIC and RA (Resistor Array). But if you have an oscilloscope, you can easily determine the problem site or IC malfunction by checking the main signal lines.
Even if you don’t have such a measuring instrument, by checking each main signal line and resoldering it, in many cases the problem will be resolved.
An explanation of the main signals (for booting up the unit) is presented below.

Don't replace ICs or stop repairing until checking the signal lines.
An IC malfunction rarely occurs. (By understanding the necessary signals for booting up the unit, the "Not Boot up" display is not a serious problem.)

What are the main signals for booting up the unit?
Please refer to DIGITAL BLOCK DIAGRAM ().
The ASIC (IC606) controls all the other digital ICs. When the power is turned on, the ASIC

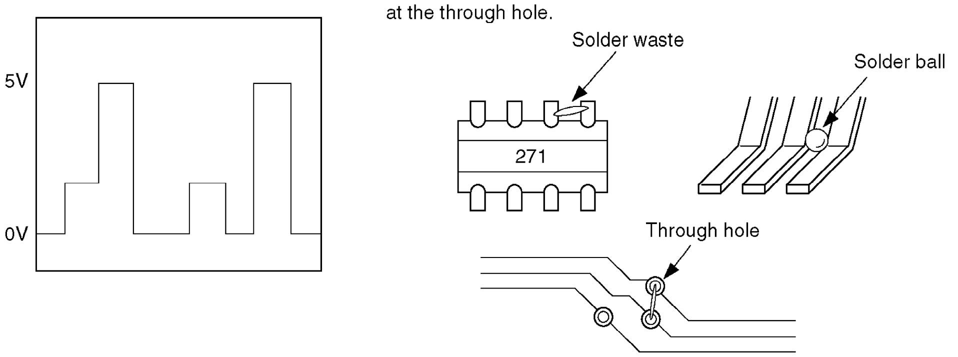
retrieves the operation code stored in the ROM (IC607), then follows the instructions for controlling each IC. All ICs have some inner registers that are assigned to a certain address.

It is the address bus by which the ASIC designates the location inside each IC. And the data bus reads or writes the data in order to transmit the instructions from the ASIC to the ICs.

These signal lines are all controlled by voltages of 3.3V (H) or 0V (L).

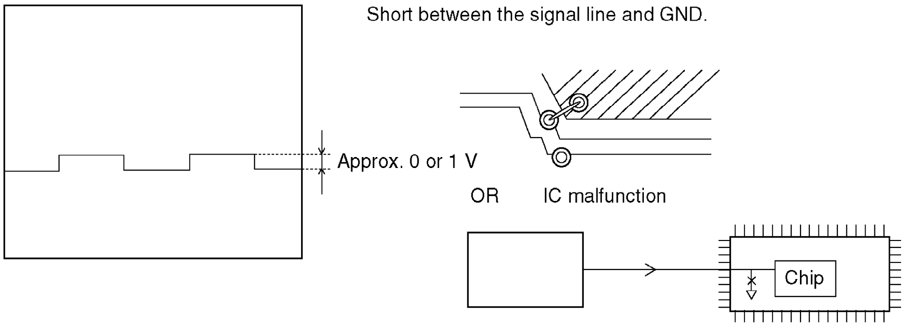
8.4.1. NG EXAMPLE

1.


Short circuit from the adjacent signal wires.
Check for a short circuit in the RA and IC leads and the signal wire at the through hole.

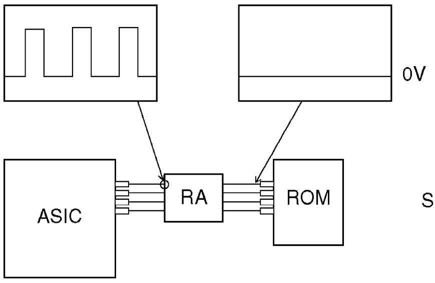
5V
0V
Solder waste
271
Solder ball
Through hole

2.


Short between the signal line and GND.

Approx. 0 or 1 V
OR
IC malfunction
Chip

3.


Solder fault on RA.

0V
ASIC
RA
ROM

8.5. MODEM SECTION

8.5.1. FUNCTION

The unit uses MODEM (IC600) that serves as an interface between the control section for FAX transmission and reception and the telephone line. During a transmitting operation, the digital

image signals are modulated and sent to the telephone line.

During a receiving operation, the analog image signals which are received via the telephone line are demodulated and converted into digital image signals. The communication format and procedures for FAX communication are standardized by ITU-T. MODEM has hardware which sends and detects all of the necessary signals for FAX communication.

It can be controlled by writing commands from the ASIC (IC606: inside ASIC).

This MODEM also sends DTMF signals, generates a call tone (from the speaker), and detects a busy tone and dial tones.

Overview of Facsimile Communication Procedures (ITU-T Recommendation):

1. ON CCITT (International Telegraph and Telephone Consultative Committee)

   The No. XIV Group of ITU-T, one of the four permanent organizations of the International Telecommunications Union (ITU), investigates and make recommendations on international standards for facsimiles.

2. Definition of Each Group

   - Group I (G1)

     Official A-4 size documents without using formats which reduce the band width of a signal are sent over telephone lines. Determined in 1968.

     Transmission for about 6 minutes at a scanning line density of 3.85 lines/mm.

   - Group II (G2)

     Using reduction technology in the modulation/demodulation format, an A-4 size document is sent at an official scanning line density of 3.85 lines/mm for about 3 minutes.

     Methods to suppress redundancy are not used.

     Determined in 1976.

   - Group III (G3)

     Method of suppressing redundancy in the image signal prior to modulation is used. An A-4 size document is sent within about one minute.

     Determined in 1980.

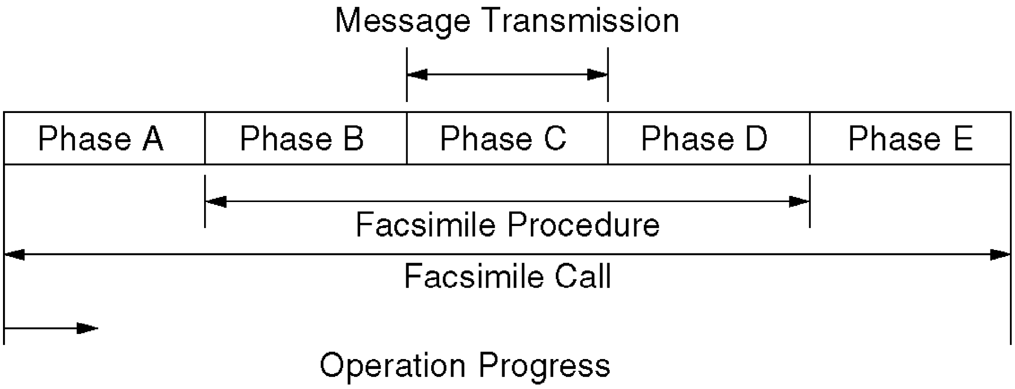
   - Group IV (G4)

     Transmission is via the data network. A method is provided for suppressing redundancy in signals prior to transmission, and error-free reception of transmission is possible.

The scope of these facsimile applications is not limited simply to transmission of written statements. Through symbiotic linkages with other communication methods, it can be expected to expand to include integrated services.

3. Facsimile Call Time Series

As shown in the following diagram, the facsimile call time series is divided into five phases.



Phase A : Call setting

Call setting can be manual/automatic.

Phase B : Pre-message procedure

Phase B is a pre-processing procedure and sequence for confirming the status of the terminal, transmission route, etc., and for terminal control. It implements terminal preparation status, determines and displays terminal constants, confirms synchronization status, etc. and prepares for transmission of facsimile messages.

Phase C : Message transmission

Phase C is the procedure for the transmitting facsimile messages.

Phase D : Post message procedure

Phase D is the procedure for confirming that the message is completed and received. For continuous transmission, phase B or phase C is repeated for transmission.

Phase E : Call retrieval

Phase E is the procedure for call retrieval, that is for circuit disconnection.

4. Concerning Transmission Time

[Transmission Time] = [Control Time] + [Image Transmission Time] + [Hold Time]

Transmission time consists of the following.

Control time:
This is time at the start of transmission when the functions at the sending and receiving sides are confirmed, the transmission mode is established, and transmission and reception are synchronized.

Image transmission time:
This is the time required for the transmission of document contents (image data). In general, this time is recorded in the catalog, etc.

Hold time:
This is the time required after the document contents have been sent to confirm that the document was actually sent, and to check for telephone reservations and/or the existence of continuous transmission.

5. Facsimile Standards

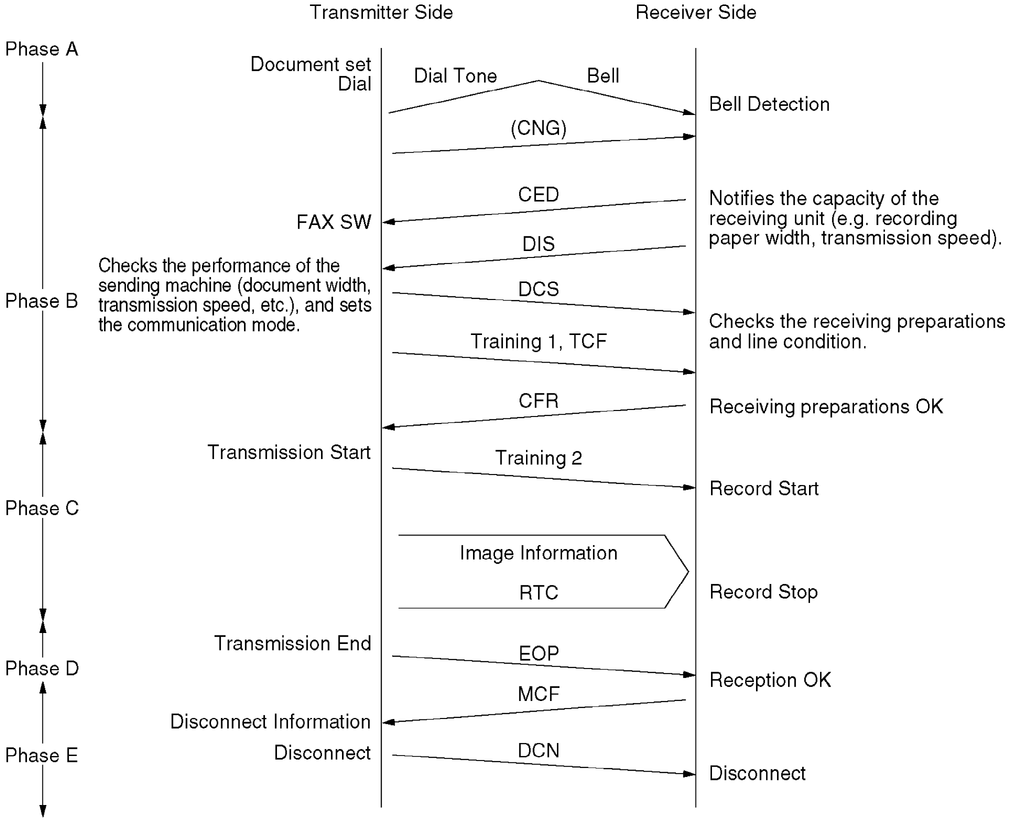
Item	Telephone Network Facsimile
	G3 Machine
Connection Control Mode	Telephone Network Signal Mode
Terminal Control Mode	T. 30 Binary
Facsimile Signal Format	Digital
Modulation Mode	PSK (V. 27 ter) or QAM (V. 29)
Transmission Speed	300 bps (Control Signal) 2400, 4800, 7200, 9600, 12000, 14400 bps (FAX Signal)
Redundancy Compression Process (Coding Mode)	1 dimension: MH Mode 2 dimension: MR Mode (K=2.4)
Resolution	Main Scan: 8 pel/mm Sub Scan: 3.85, 7.7l/mm
Line Synchronization Signal	EOL Signal
1 Line Transmission Time [ms/line]	Depends on the degree of data reduction. Minimum Value: 10, 20 Can be recognized in 40ms.

6. Explanation of Communication and Compression Technology

A. G3 Communication Signals (T. 30 Binary Process)

For G3 Facsimile communication, this is the procedure for exchanging control signals between the sending and receiving

machines both before and after transmission of image signals. Control signals at 300 bps FSK are: 1850 Hz...0, 1650Hz...1. An example of a binary process in G3 communication is shown below.


Transmitter Side
Receiver Side
Phase A
Phase B
Phase C
Phase D
Phase E
Document set
Dial
Dial Tone
Bell
Bell Detection
(CNG)
CED
FAX SW
Notifies the capacity of the receiving unit (e.g. recording paper width, transmission speed).
DIS
Checks the performance of the sending machine (document width, transmission speed, etc.), and sets the communication mode.
DCS
Checks the receiving preparations and line condition.
Training 1, TCF
CFR
Receiving preparations OK
Transmission Start
Training 2
Record Start
Image Information
RTC
Record Stop
Transmission End
EOP
Reception OK
MCF
Disconnect Information
Disconnect
DCN
Disconnect

Explanation of Signals

Control signals are comprised mainly of 8-bit identification signals and the data signals added to them. Data signals are added to DIS and DCS signals.

Signal.....DIS (Digital Identification Signal)

Identification Signal Format.....00000001

Function:

Notifies the capacity of the receiving unit. The added data signals are as follows.

Signal.....DCS (Digital Command Signal)

Identification Signal Format.....X1000001

Example

(Some models do not support the following items.):

Bit No.	DIS/DTC	DCS
1	Transmitter --- T.2 operation	
2	Receiver --- T.2 operation	Receiver --- T.2 operation
3	T.2 IOC = 176	T.2 IOC = 176
4	Transmitter --- T.3 operation	
5	Receiver --- T.3 operation	Receiver --- T.3 operation
6	Reserved for future T.3 operation features	
7	Reserved for future T.3 operation features.	
8	Reserved for future T.3 operation features.	
9	Transmitter --- T.4 operation	
10	Receiver --- T.4 operation	Receiver --- T.4 operation
11, 12, 13, 14	Data signaling rate	Data signaling rate
0, 0, 0, 0	V.27 ter fall back mode	2400 bit/s, V.27 ter
0, 1, 0, 0	V.27 ter	4800 bit/s, V.27 ter
1, 0, 0, 0	V.29	9600 bit/s, V.29
1, 1, 0, 0	V.27 ter and V.29	7200 bit/s, V.29
0, 0, 1, 0	Not used	14400 bit/s, V.33
0, 1, 1, 0	Reserved	12000 bit/s, V.33
1, 0, 1, 0	Not used	Reserved
1, 1, 1, 0	V.27 ter and V.29 and V.33	Reserved
0, 0, 0, 1	Not used	14400 bit/s, V.17
0, 1, 0, 1	Reserved	12000 bit/s, V.17
1, 0, 0, 1	Not used	9600 bit/s, V.17
1, 1, 0, 1	V.27 ter and V.29 and V.33 and V.17	7200 bit/s, V.17
0, 0, 1, 1	Not used	Reserved
0, 1, 1, 1	Reserved	Reserved
1, 0, 1, 1	Not used	Reserved
1, 1, 1, 1	Reserved	Reserved
15	R8×7.7 lines/mm and/or 200×200 pels/ 25.4mm	R8×7.7 lines/mm and/or 200×200 p 25.4mm
16	Two-dimensional coding capability	Two-dimensional coding capabilit

Bit No.	DIS/DTC	DCS
17, 18 (0, 0) (0, 1) (1, 0) (1, 1)	Recording width capabilities 1728 picture elements along scan line length of 215 mm ± 1% 1728 picture elements along scan line length of 215 mm ± 1% 2048 picture elements along scan line length of 255 mm ± 1% 2432 picture elements along scan line length of 303 mm ± 1% 1728 picture elements along scan line length of 215 mm ± 1% 2048 picture elements along scan line length of 255 mm ± 1% Invalid	Recording width 1728 picture elements along scan length of 215 mm ± 1% 2432 picture elements along scan length of 303 mm ± 1% 2048 picture elements along scan length of 255 mm ± 1% Invalid
19, 20 (0, 0) (0, 1) (1, 0) (1, 1)	Maximum recording length capability A4 (297 mm) Unlimited A4 (297 mm) and B4 (364 mm) Invalid	Maximum recording length A4 (297 mm) Unlimited B4 (364 mm) Invalid
21, 22, 23 (0, 0, 0) (0, 0, 1) (0, 1, 0) (1, 0, 0) (0, 1, 1) (1, 1, 0) (1, 0, 1) (1, 1, 1)	Minimum scan line time capability of the receiver 20 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$ 40 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$ 10 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$ 5 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$ 10 ms at 3.85 l/mm: $T_{7.7} = 1/2\ T_{3.85}$ 20 ms at 3.85 l/mm: $T_{7.7} = 1/2\ T_{3.85}$ 40 ms at 3.85 l/mm: $T_{7.7} = 1/2\ T_{3.85}$ 0 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$	Minimum scan line time 20 ms 40 ms 10 ms 5 ms 0 ms
24	Extend field	Extend field
25	2400 bit/s handshaking	2400 bit/s handshaking
26	Uncompressed mode	Uncompressed mode
27	Error correction mode	Error correction mode
28	Set to “0”.	Frame size 0 = 256 octets 1 = 64 o
29	Error limiting mode	Error limiting mode
30	Reserved for G4 capability on PSTN	Reserved for G4 capability on PS
31	T.6 coding capability	T.6 coding enabled
32	Extend field	Extend field

Bit No.	DIS/DTC	DCS
33	Validity of bits 17, 18	Recording width
(0)	Bits 17, 18 are valid	Recording width indicated by bits
(1)	Bits 17, 18 are invalid	Recording width indicated by this information
34	Recording width capability 1216 picture elements along scan line length of 151 ± mm 1%	Middle 1216 elements of 1728 pict elements
35	Recording width capability 864 picture elements along scan line length of 107 ± mm 1%	Middle 864 elements of 1728 pictu elements
36	Recording width capability 1728 picture elements along scan line length of 151 ± mm 1%	Invalid
37	Recording width capability 1728 picture elements along scan line length of 107 ± mm 1%	Invalid
38	Reserved for future recording width capability.	
39	Reserved for future recording width capability.	
40	Extend field	Extend field
41	R8×15.4 lines/mm	R8×15.4 lines/mm
42	300×300 pels/25.4 mm	300×300 pels/25.4 mm
43	R16×15.4 lines/mm and/or 400×400 pels/ 25.4 mm	R16×15.4 lines/mm and/or 400×40 25.4 mm
44	Inch based resolution preferred	Resolution type selection “0”: neuritic based resolution “1”: inch based resolution
45	Metric based resolution preferred	Don’t care
46	Minimum scan line time capability for higher resolutions “0”: $T_{15.4} = T_{7.7}$ “1”: $T_{15.4} = 1/2T_{7.7}$	Don’t care
47	Selective Polling capability	Set to “0”.
48	Extend field	Extend field

Note 1 - Standard facsimile units conforming to T.2 must have the following capability: Index of cooperation (IOC)=264.

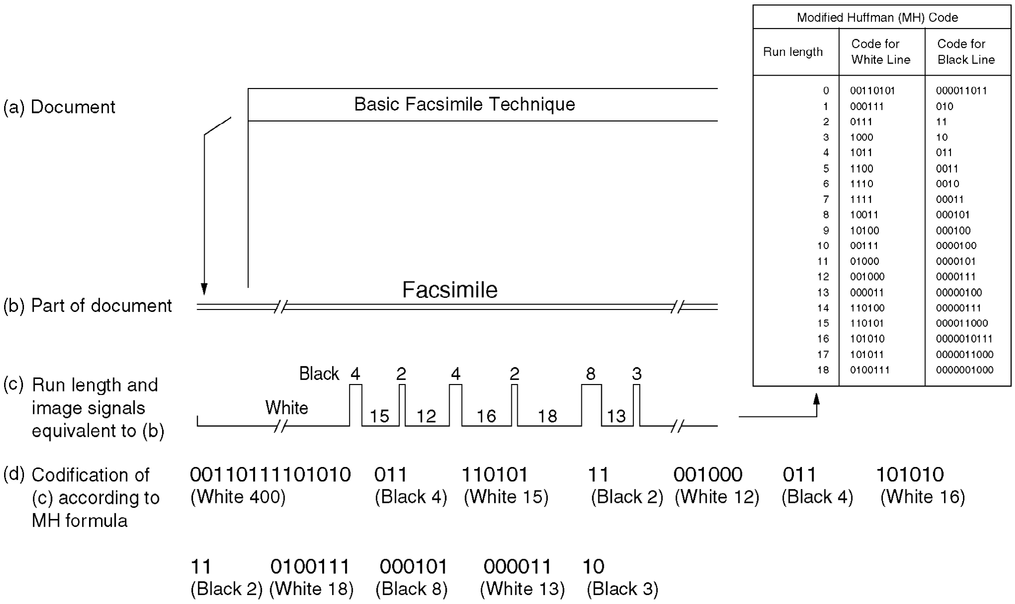
Note 2 - Standard facsimile units conforming to T.3 must have the following capability: Index of cooperation (IOC)=264.

Note 3 - Standard facsimile units conforming to T.4 must have the following capability: Paper length=297 mm.

Signal	Identification Signal Format	Function
Training 1	—	A fixed pattern is transmitted to the receiving at a speed (2400 to 14400 bps) designated by DCS, and the receiving side optimizes the automatic equalizer, etc., according to this si
TCF (Training Check)	—	Sends 0 continuously for 1.5 seconds at the speed as the training signal.
CFR (Confirmation to Receive)	X0100001	Notifies the sending side that TCF has been properly received. If TCF is not properly rece FTT (Failure To Train) X0100010 is relayed to sender. The sender then reduces the transmission speed by one stage and initiate training once again.
Training 2	—	Used for reconfirming the receiving side like training 1.
Image Signal	Refer to the next page.	—
RTC (Return to Control)	—	Sends 12 bits (0...01 × 6 times) to the receive the same speed as the image signal and noti completion of transmission of the first sheet
EOP (End of Procedure)	X1110100	End of one communication
MCF (Message Confirmation)	X0110001	End of 1 page reception
DCN (Disconnect)	X1011111	Phase E starts.
MPS (Multi-Page Signal)	X1110010	Completion of transmission of 1 page. If ther still more documents to be sent, they are out instead of EOP. After MCF reception, the sen transmits an image signal of the second she
PRI-EOP (Procedural Interrupt-EOP)	X1111100	If there is an operator call from the sender, it output after RTC.
PIP (Procedural Interrupt Positive)	X0110101	This is output when an operator call is receiv

B. Redundancy Compression Process Coding Mode

This unit uses one-dimensional MH format.

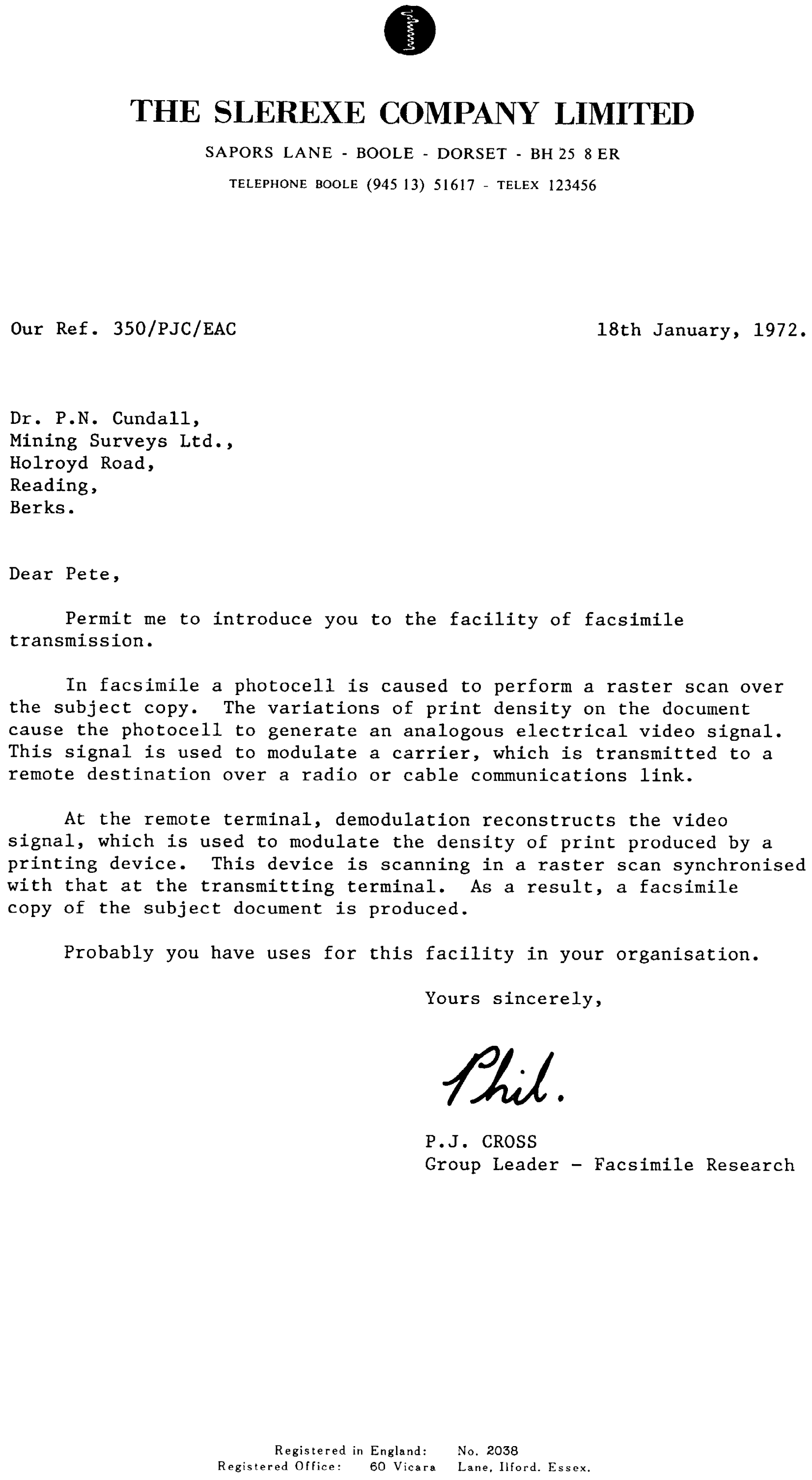

(a) Document
Basic Facsimile Technique
(b) Part of document
Facsimile
(c) Run length and image signals equivalent to (b)
Black
White
4
2
4
2
8
3
15
12
16
18
13
(d) Codification of (c) according to MH formula
00110111101010
(White 400)
011
(Black 4)
110101
(White 15)
11
(Black 2)
001000
(White 12)
011
(Black 4)
101010
(White 16)
11
(Black 2)
0100111
(White 18)
000101
(Black 8)
000011
(White 13)
10
(Black 3)

Modified Huffman (MH) Code		
Run length	Code for White Line	Code for Black Line
0	00110101	000011011
1	000111	010
2	0111	11
3	1000	10
4	1011	011
5	1100	0011
6	1110	0010
7	1111	00011
8	10011	000101
9	10100	000100
10	00111	0000100
11	01000	0000101
12	001000	0000111
13	000011	00000100
14	110100	00000111
15	110101	000011000
16	101010	0000010111
17	101011	0000011000
18	0100111	0000001000

(c) Total bit number before MH codification (497 bit)
(d) Total bit number after MH codification (63 bit)

8.6. TEST CHART

8.6.1. ITU-T No.1 TEST CHART



THE SLEREXE COMPANY LIMITED
SAPORS LANE - BOOLE - DORSET - BH 25 8 ER
TELEPHONE BOOLE (945 13) 51617 - TELEX 123456

Our Ref. 350/PJC/EAC 18th January, 1972.

Dr. P.N. Cundall,
Mining Surveys Ltd.,
Holroyd Road,
Reading,
Berks.

Dear Pete,

Permit me to introduce you to the facility of facsimile transmission.

In facsimile a photocell is caused to perform a raster scan over the subject copy. The variations of print density on the document cause the photocell to generate an analogous electrical video signal. This signal is used to modulate a carrier, which is transmitted to a remote destination over a radio or cable communications link.

At the remote terminal, demodulation reconstructs the video signal, which is used to modulate the density of print produced by a printing device. This device is scanning in a raster scan synchronised with that at the transmitting terminal. As a result, a facsimile copy of the subject document is produced.

Probably you have uses for this facility in your organisation.

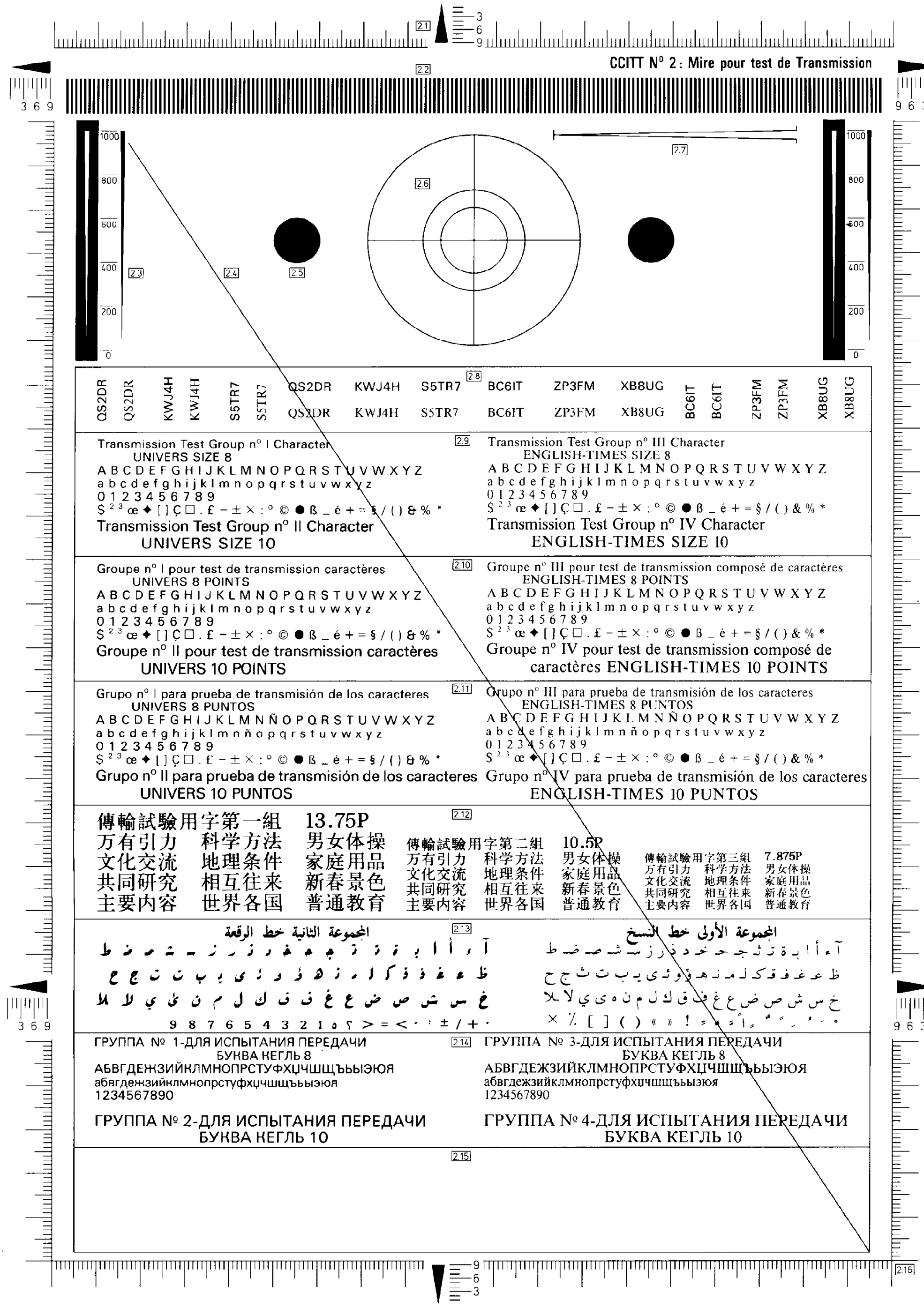
Yours sincerely,

Phil.

P.J. CROSS
Group Leader - Facsimile Research

Registered in England: No. 2038
Registered Office: 60 Vicara Lane, Ilford. Essex.

8.6.2. ITU-T No.2 TEST CHART



CCITT N° 2: Mire pour test de Transmission

QS2DR KWJ4H S5TR7 BC6IT ZP3FM XB8UG

Transmission Test Group n° I Character
UNIVERS SIZE 8
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z
0 1 2 3 4 5 6 7 8 9
$ ² ³ œ ◆ [ ] Ç □ . £ − ± × : ° © ● ß _ é + = § / ( ) & % *
Transmission Test Group n° II Character
UNIVERS SIZE 10

Transmission Test Group n° III Character
ENGLISH-TIMES SIZE 8
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z
0 1 2 3 4 5 6 7 8 9
$ ² ³ œ ◆ [ ] Ç □ . £ − ± × : ° © ● ß _ é + = § / ( ) & % *
Transmission Test Group n° IV Character
ENGLISH-TIMES SIZE 10

Groupe n° I pour test de transmission caractères
UNIVERS 8 POINTS
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z
0 1 2 3 4 5 6 7 8 9
$ ² ³ œ ◆ [ ] Ç □ . £ − ± × : ° © ● ß _ é + = § / ( ) & % *
Groupe n° II pour test de transmission caractères
UNIVERS 10 POINTS

Groupe n° III pour test de transmission composé de caractères
ENGLISH-TIMES 8 POINTS
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z
0 1 2 3 4 5 6 7 8 9
$ ² ³ œ ◆ [ ] Ç □ . £ − ± × : ° © ● ß _ é + = § / ( ) & % *
Groupe n° IV pour test de transmission composé de caractères ENGLISH-TIMES 10 POINTS

Grupo n° I para prueba de transmisión de los caracteres
UNIVERS 8 PUNTOS
A B C D E F G H I J K L M N Ñ O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n ñ o p q r s t u v w x y z
0 1 2 3 4 5 6 7 8 9
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Grupo n° II para prueba de transmisión de los caracteres
UNIVERS 10 PUNTOS

Grupo n° III para prueba de transmisión de los caracteres
ENGLISH-TIMES 8 PUNTOS
A B C D E F G H I J K L M N Ñ O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n ñ o p q r s t u v w x y z
0 1 2 3 4 5 6 7 8 9
$ ² ³ œ ◆ [ ] Ç □ . £ − ± × : ° © ● ß _ é + = § / ( ) & % *
Grupo n° IV para prueba de transmisión de los caracteres
ENGLISH-TIMES 10 PUNTOS

傳輸試驗用字第一組　13.75P
万有引力　科学方法　男女体操
文化交流　地理条件　家庭用品
共同研究　相互往来　新春景色
主要内容　世界各国　普通教育

傳輸試驗用字第二組　10.5P
万有引力　科学方法　男女体操
文化交流　地理条件　家庭用品
共同研究　相互往来　新春景色
主要内容　世界各国　普通教育

傳輸試驗用字第三組　7.875P
万有引力　科学方法　男女体操
文化交流　地理条件　家庭用品
共同研究　相互往来　新春景色
主要内容　世界各国　普通教育

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المجموعة الأولى خط النسخ

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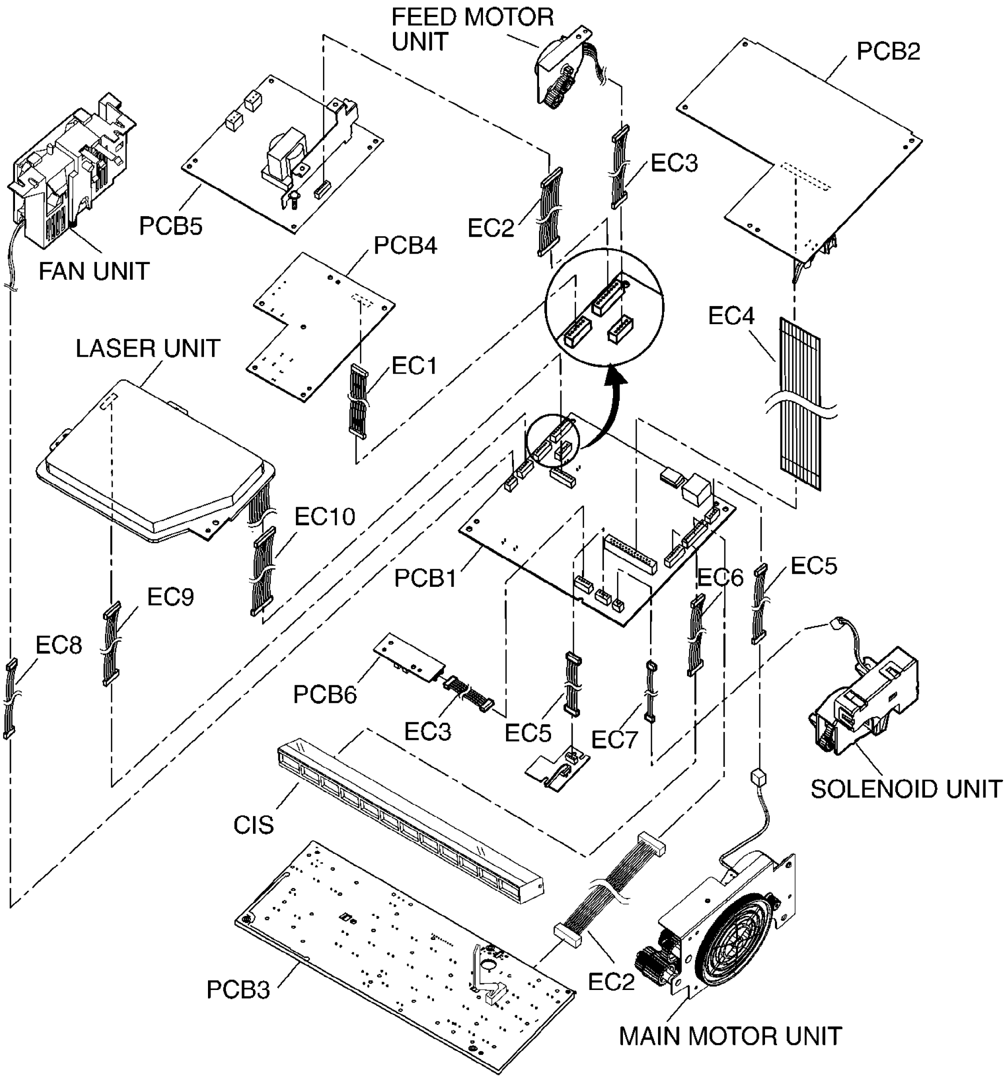
ГРУППА № 1-ДЛЯ ИСПЫТАНИЯ ПЕРЕДАЧИ
БУКВА КЕГЛЬ 8
АБВГДЕЖЗИЙКЛМНОПРСТУФХЦЧШЩЪЬЫЭЮЯ
абвгдежзийклмнопрстуфхцчшщъьыэюя
1234567890

ГРУППА № 2-ДЛЯ ИСПЫТАНИЯ ПЕРЕДАЧИ
БУКВА КЕГЛЬ 10

ГРУППА № 3-ДЛЯ ИСПЫТАНИЯ ПЕРЕДАЧИ
БУКВА КЕГЛЬ 8
АБВГДЕЖЗИЙКЛМНОПРСТУФХЦЧШЩЪЬЫЭЮЯ
абвгдежзийклмнопрстуфхцчшщъьыэюя
1234567890

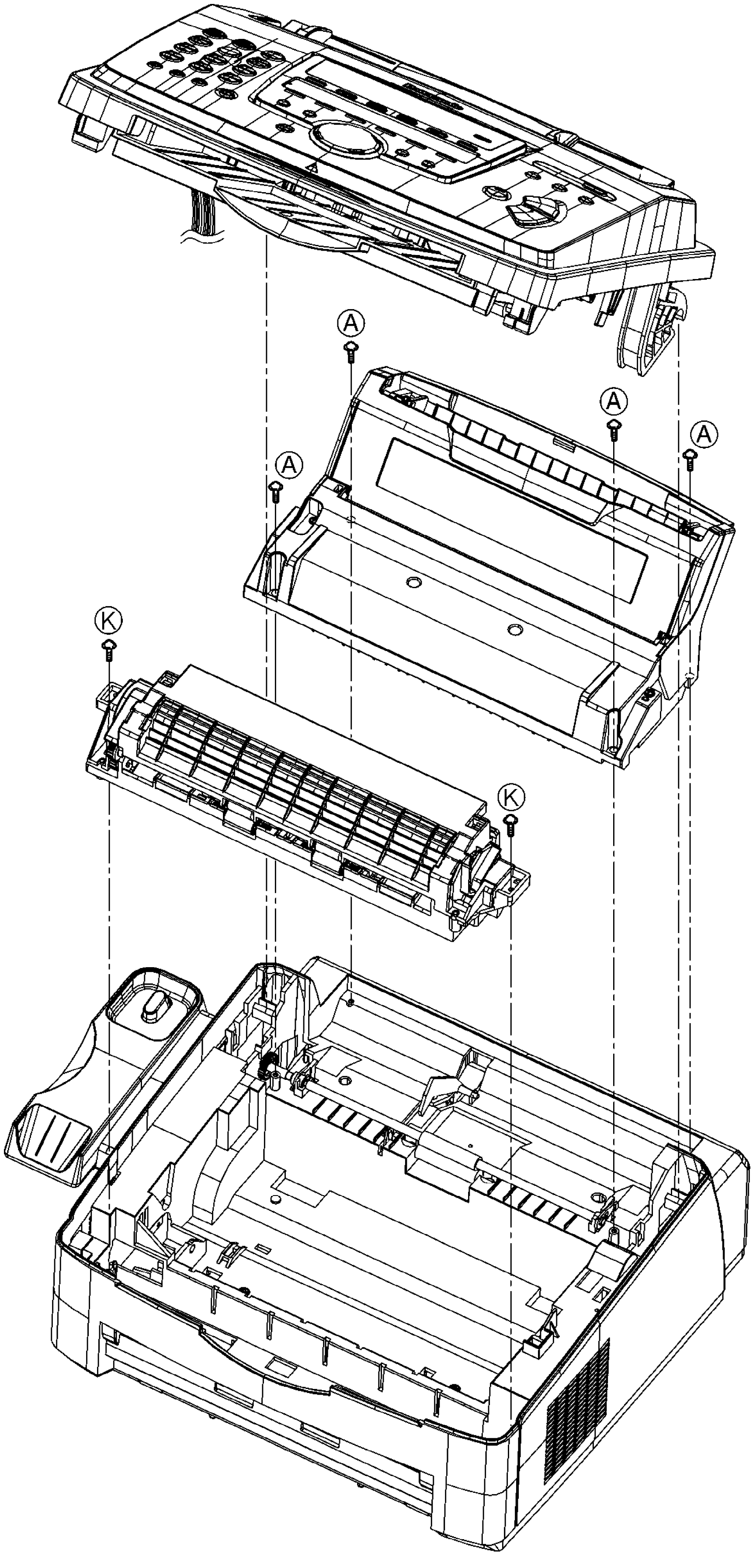
ГРУППА № 4-ДЛЯ ИСПЫТАНИЯ ПЕРЕДАЧИ
БУКВА КЕГЛЬ 10

9. FIXTURES AND TOOLS


FEED MOTOR UNIT
PCB2
PCB5
FAN UNIT
EC3
EC2
PCB4
EC4
LASER UNIT
EC1
EC10
PCB1
EC6
EC5
EC9
EC8
PCB6
EC3
EC5
EC7
SOLENOID UNIT
CIS
PCB3
EC2
MAIN MOTOR UNIT

10. CABINET, MECHANICAL AND ELECTRICAL PARTS LOCATION

10.1. GENERAL SECTION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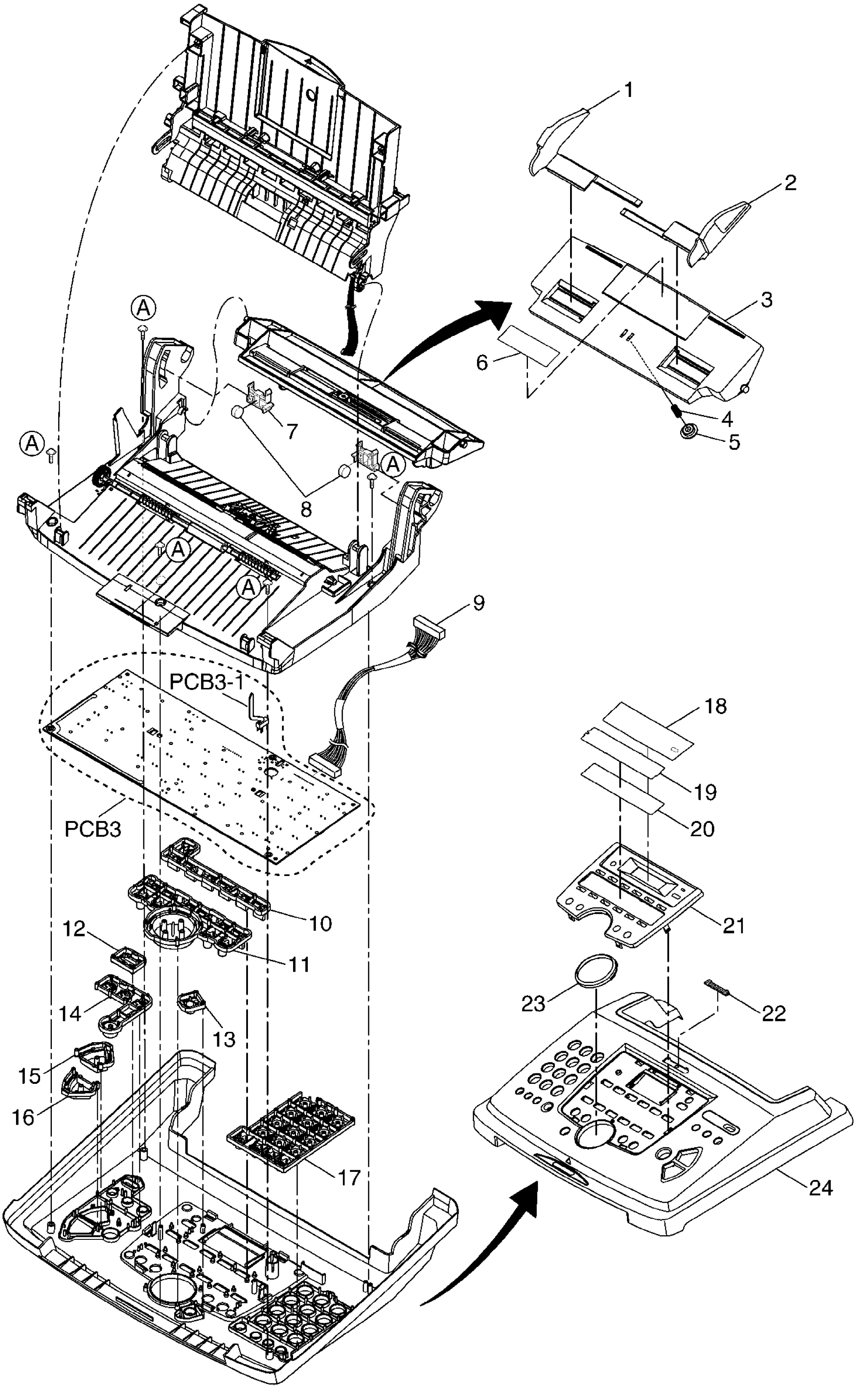
10.2. OPERATION COVER SECTION (1)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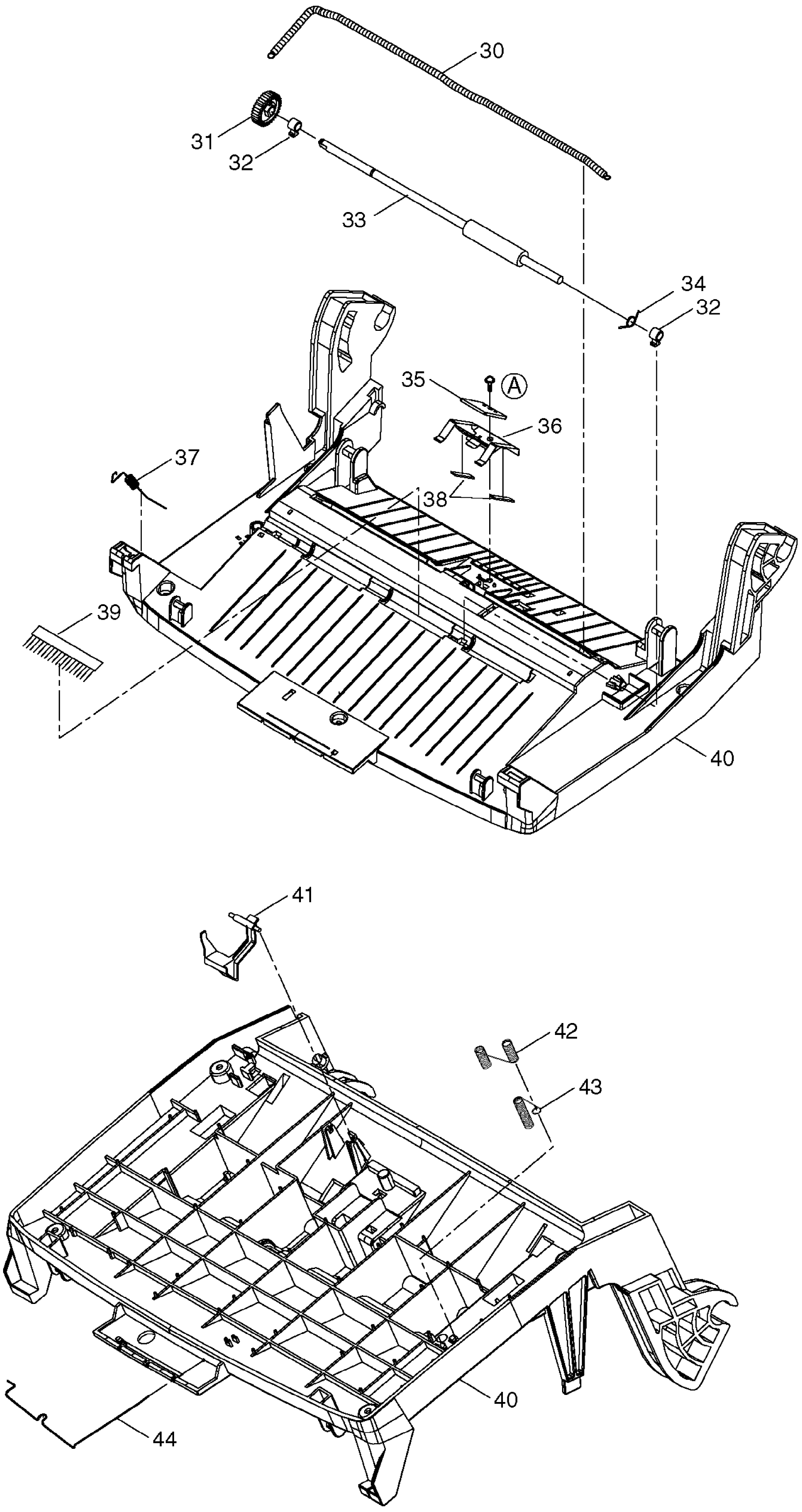
PCB3-1
PCB3

10.3. OPERATION COVER SECTION (2)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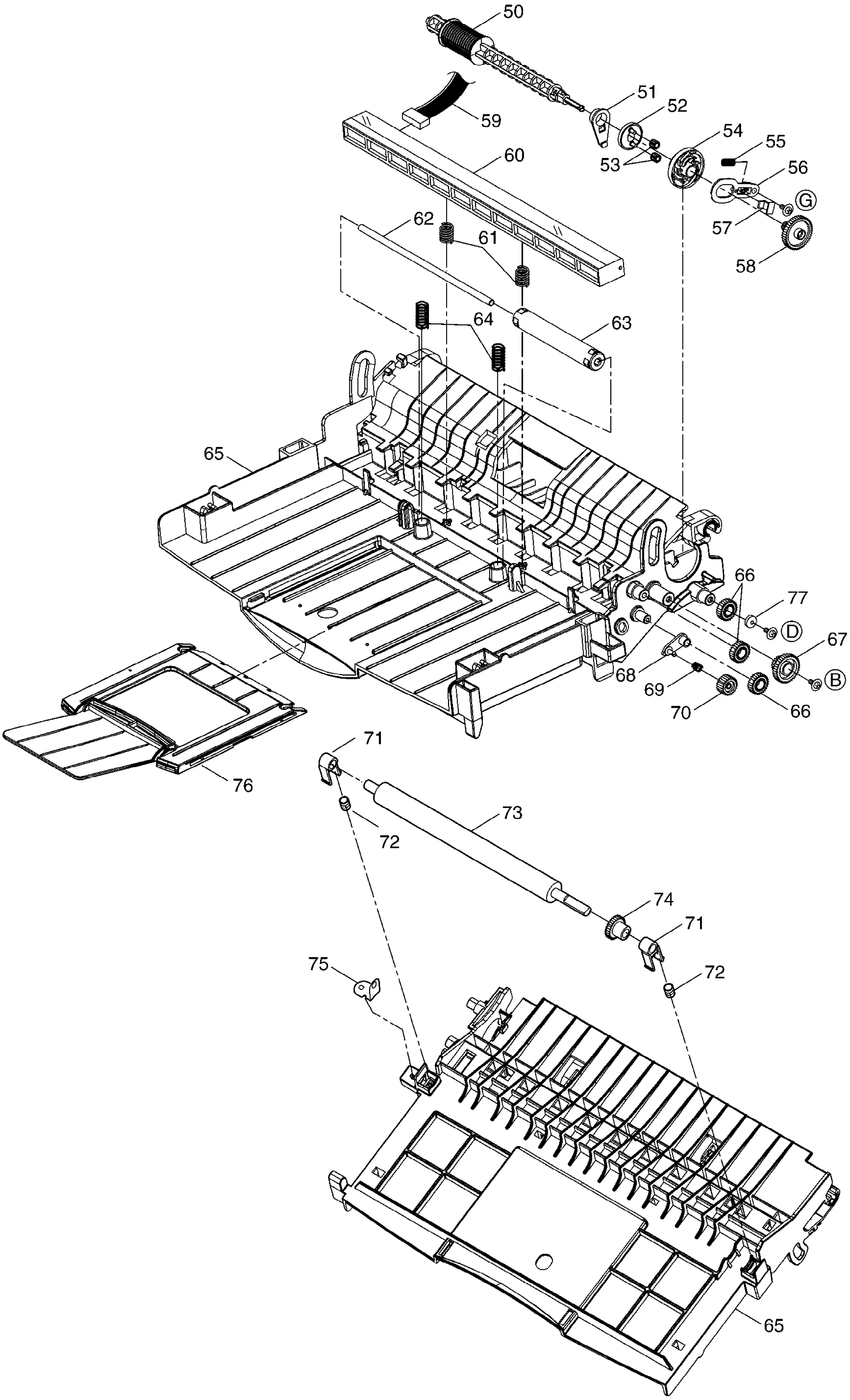
10.4. OPERATION COVER SECTION (3)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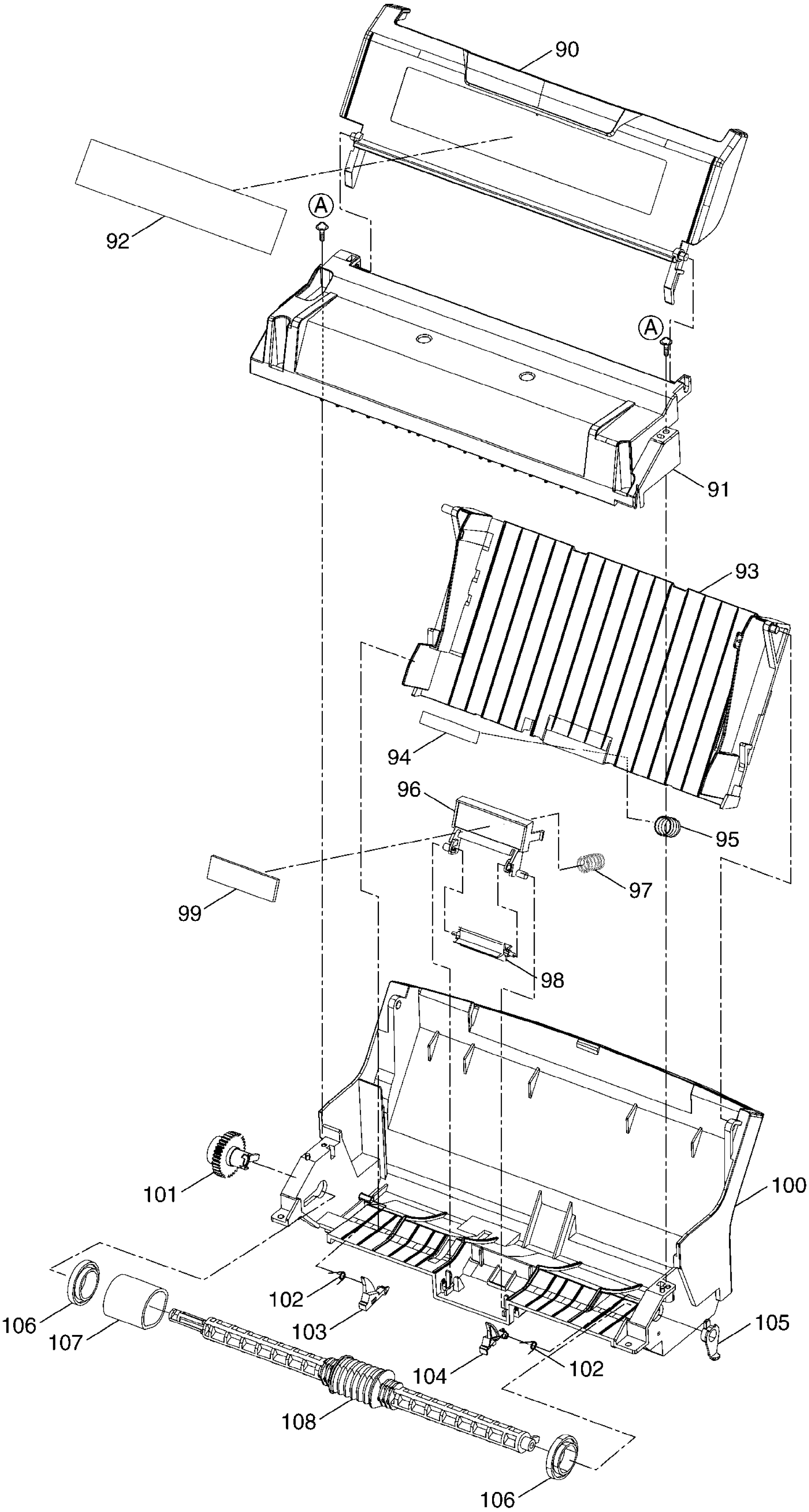
10.5. PICK UP SECTION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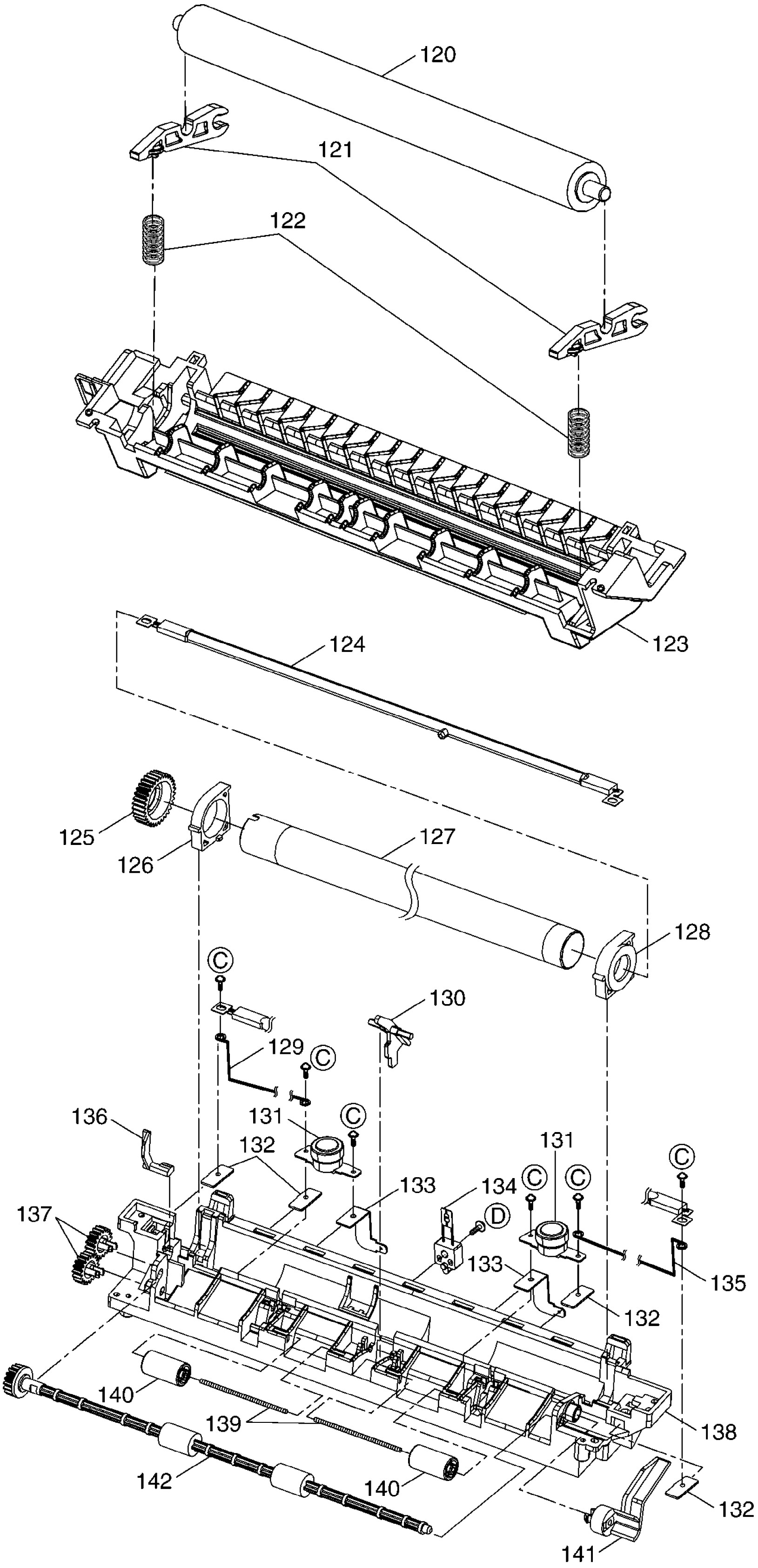
A

10.6. FUSER SECTION


120
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131
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C
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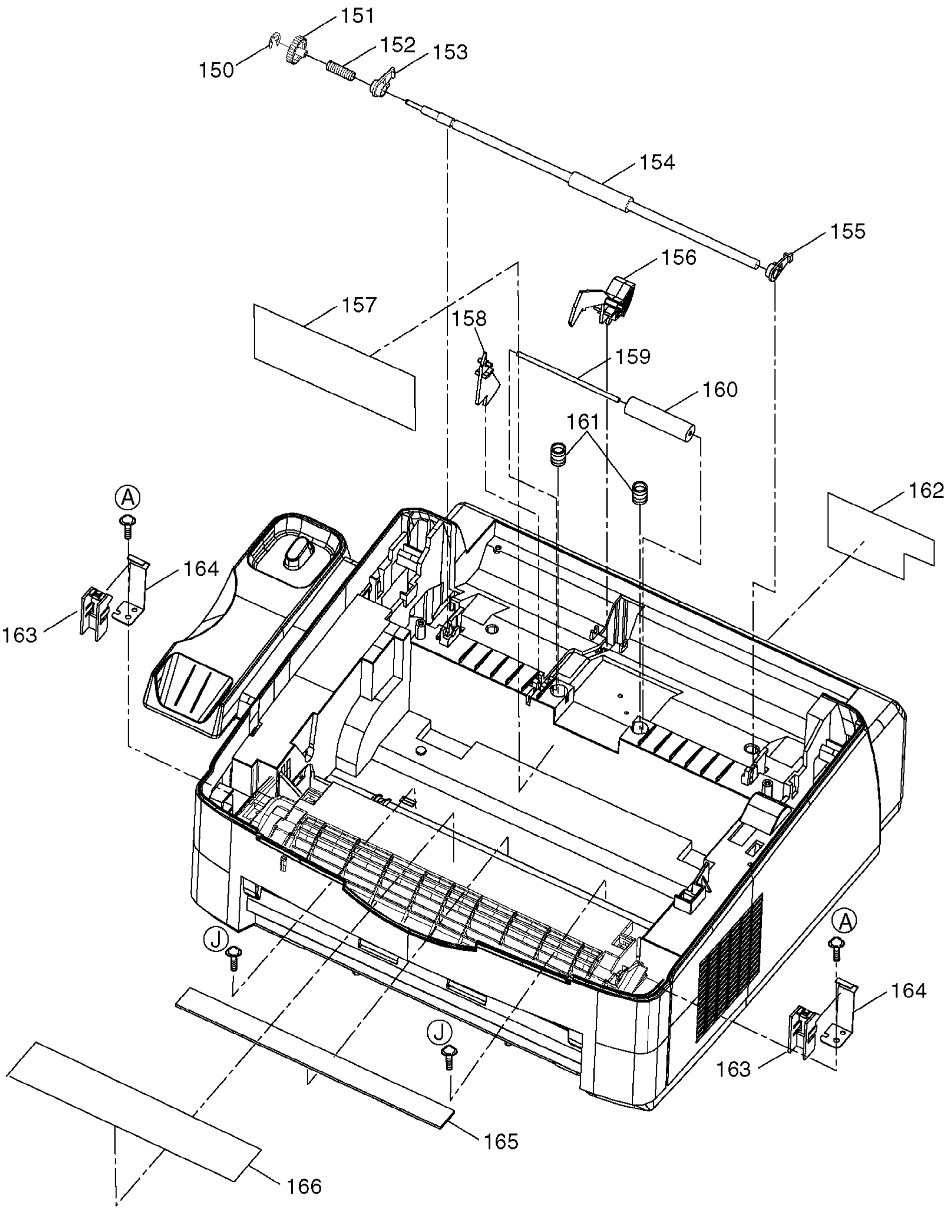
10.7. UPPER MAIN CABINET SECTION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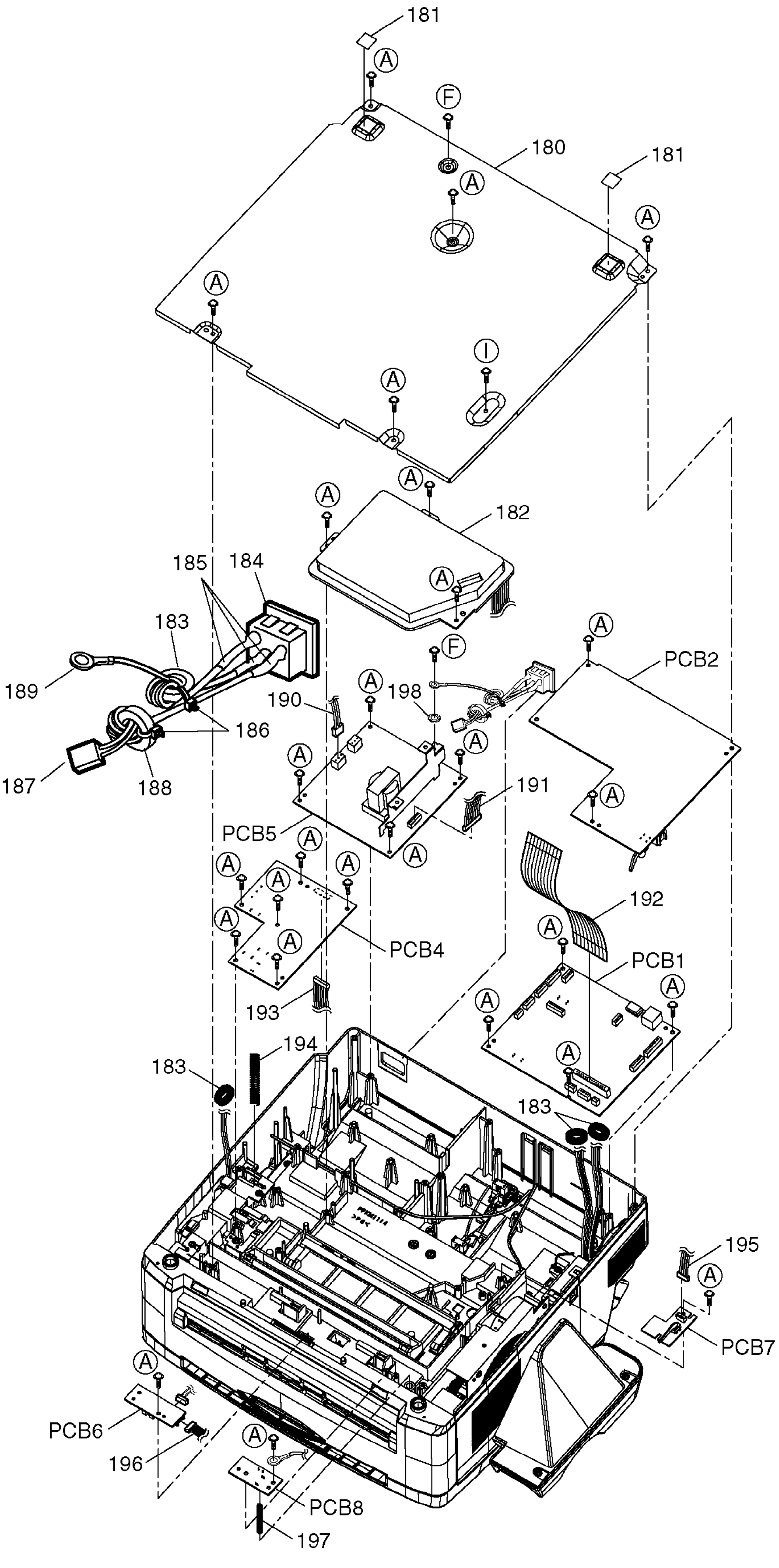
10.8. LOWER MAIN CABINET SECTION (1)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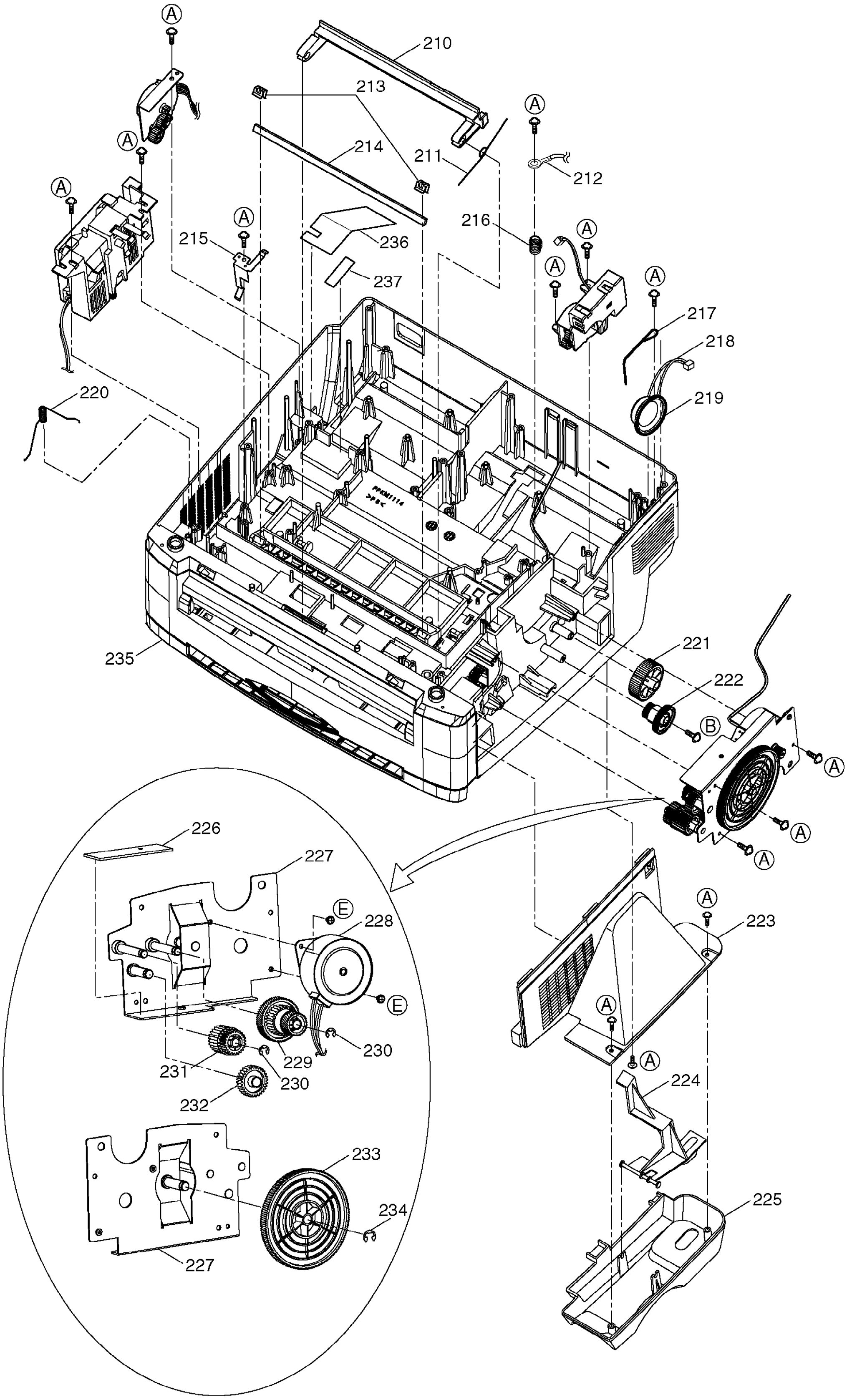
Ⓐ
PCB2
Ⓐ
191
PCB5
Ⓐ
Ⓐ
Ⓐ
Ⓐ
Ⓐ
Ⓐ
PCB4
192
Ⓐ
PCB1
Ⓐ
Ⓐ
193
194
Ⓐ
183
183
195
Ⓐ
PCB7
Ⓐ
PCB6
196
Ⓐ
PCB8
197

10.9. LOWER MAIN CABINET SECTION (2)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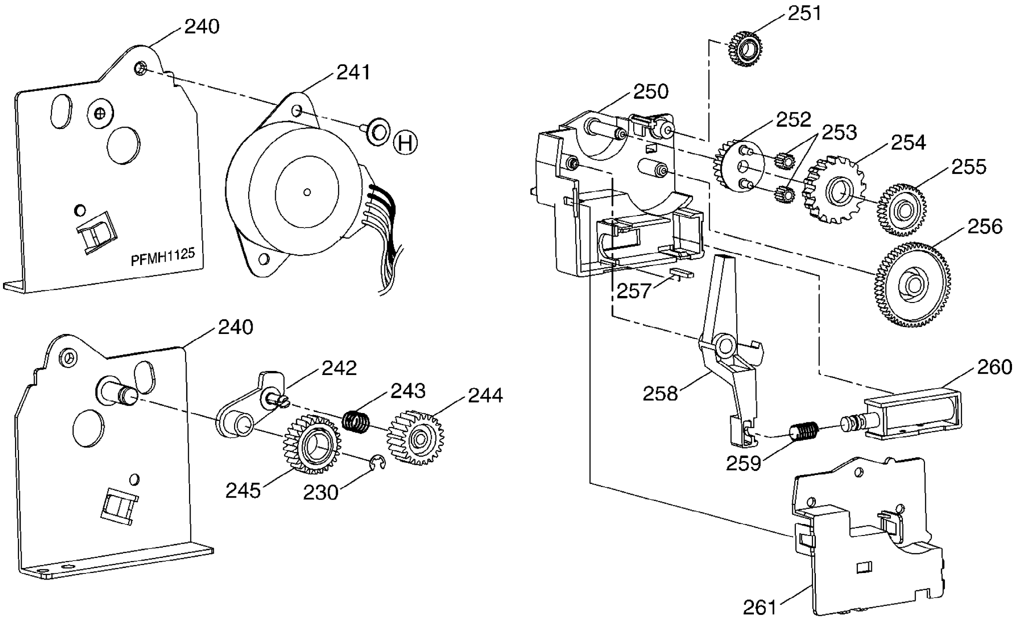
10.10. LOWER CABINET SECTION (3)


240
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PFMH1125
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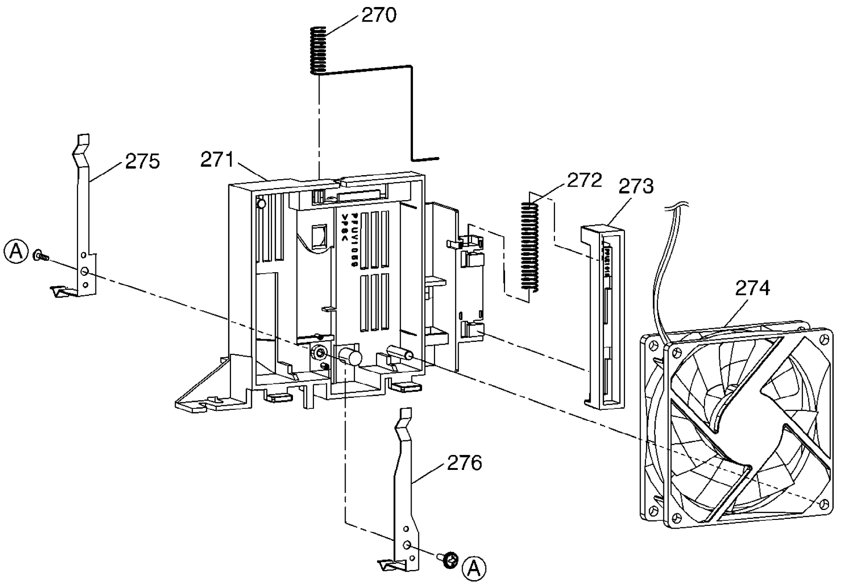
270
275
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273
A
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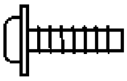
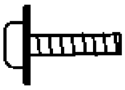
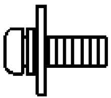
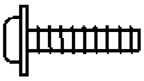
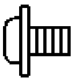
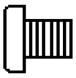
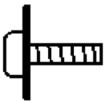
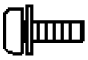
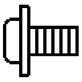
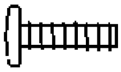
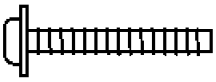
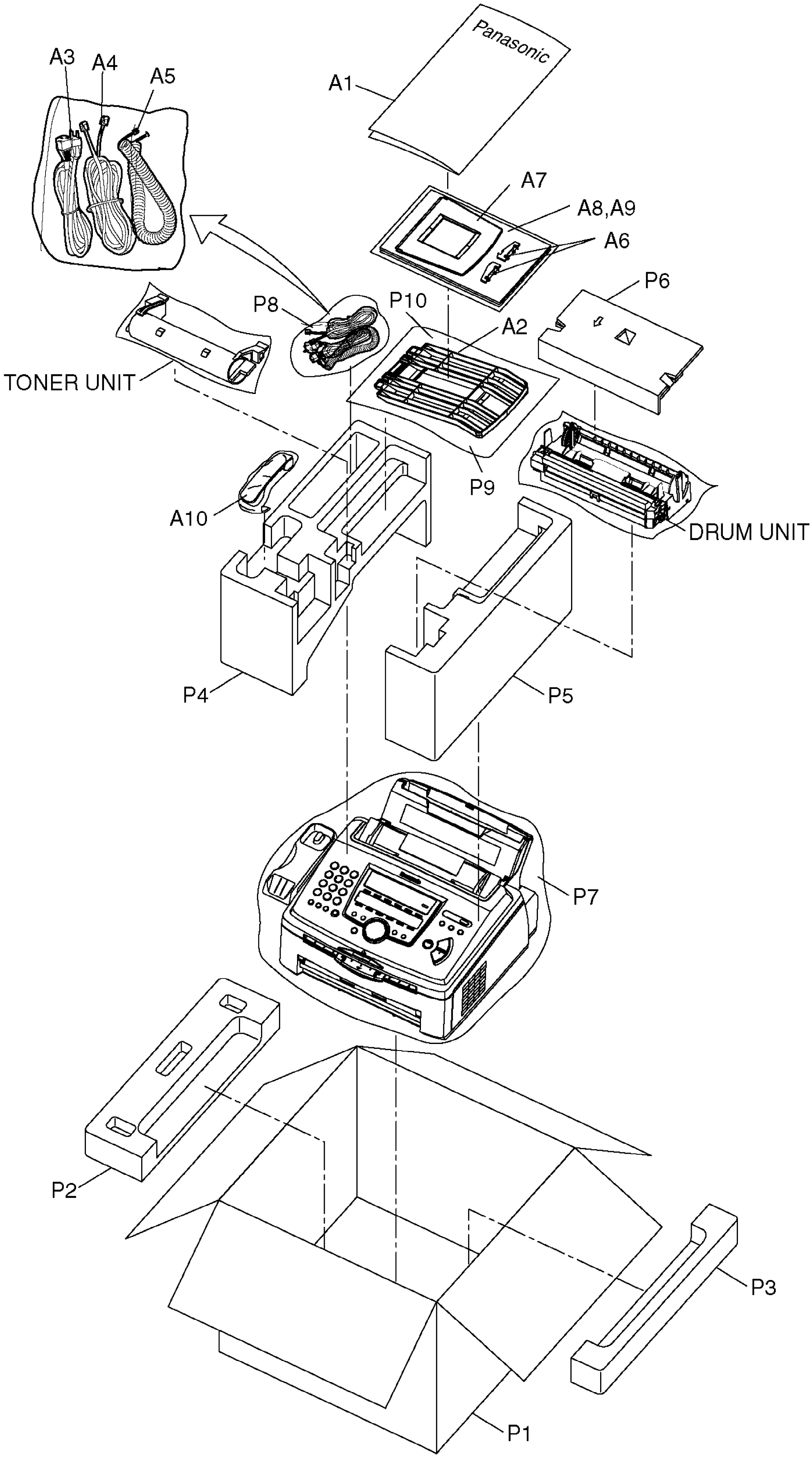
276
A

10.11. ACTUAL SIZE OF SCREWS AND WASHER

	Parts No.	Illustration
Ⓐ	XTW3+S10P	
Ⓑ	XTW3+W10P	
Ⓒ	XYC3+FF8C	
Ⓓ	XTW3+S12P	
Ⓔ	XTW3+5LFZ	
Ⓕ	XSB4+6	
Ⓖ	XTW4+W8P	
Ⓗ	XYN3+C6	
Ⓘ	XTW3+6L	
Ⓙ	XTB3+10G	
Ⓚ	XTW3+S20P	

11. ACCESSORIES AND PACKING MATERIALS

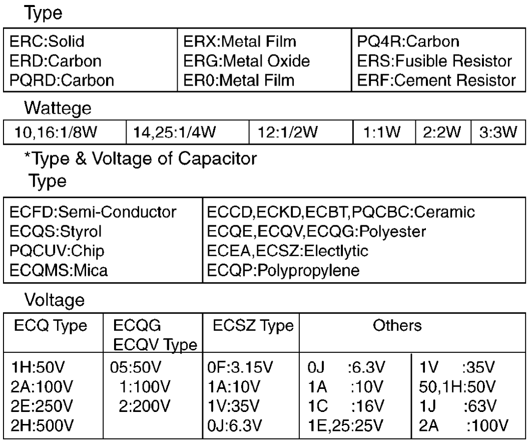

A3
A4
A5
A1
Panasonic
A7
A8,A9
A6
P6
P8
P10
A2
TONER UNIT
A10
P9
DRUM UNIT
P4
P5
P7
P2
P3
P1

12. REPLACEMENT PARTS LIST

RTL (Retention Time Limited)

Notes:

1. **The marking (RTL) indicates that the Retention Time is limited for this item.**
   After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing parts and product retention.
   After the end of this period, the assembly will no longer be available.
2. **Important safety notice**
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacture's specified parts.
3. **The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.**
4. **ISO code (Example : ABS-HB) of the remarks column shows quality of the material and a flame resisting grade about plastics.**
5. **RESISTORS & CAPACITORS**
   Unless otherwise specified;
   All resistors are in ohms (Ω) k=1000 Ω , M=1000k Ω
   All capacitors are in MICRO FARADS (μ F) P= μ μ F
   ***Type & Wattage of Resistor**



Type

ERC:Solid ERD:Carbon PQRD:Carbon	ERX:Metal Film ERG:Metal Oxide ER0:Metal Film	PQ4R:Carbon ERS:Fusible Resistor ERF:Cement Resistor

Wattege

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor

Type

ECFD:Semi-Conductor ECQS:Styrol PQCUV:Chip ECQMS:Mica	ECCD,ECKD,ECBT,PQCBC:Ceramic ECQE,ECQV,ECQG:Polyester ECEA,ECSZ:Electlytic ECQP:Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H:50V 2A:100V 2E:250V 2H:500V	05:50V 1:100V 2:200V	0F:3.15V 1A:10V 1V:35V 0J:6.3V	0J :6.3V 1A :10V 1C :16V 1E,25:25V	1V :35V 50,1H:50V 1J :63V 2A :100V

12.1. CABINET AND ELECTRICAL PARTS

12.1.1. OPERATION COVER SECTION (1)

Ref. No.	Part No.	Part Name & Description	Remarks
1	PFKR1029Z1	GUIDE,DOCUMENT L	ABS-HB
2	PFKR1030Z1	GUIDE,DOCUMENT R	ABS-HB
3	PFKE1030X1	GUIDE,DOCUMENT	PS-HB
4	PFUS1222Z	COIL SPRING,SLIDER	
5	PFDG1015Y	GEAR,SLIDER	
6	PFQT2112Z	LABEL,FACE DOWN	
7	PFME1001Z	SPACER ,DUMPER	
8	PFHG1094Z	RUBBER,DUMPER	
9	PFJS08P33Z	CONNECTOR,8P	
10	PFBX1192Z1	PUSH BUTTON,DERC	ABS-HB
11	PFBX1191Z1	PUSH BUTTON,NAVI	ABS-HB
12	PFBC1100Z1	PUSH BUTTON,AUTO ANSWER	ABS-HB
13	PFBC1098Z1	PUSH BUTTON,MENU	ABS-HB
14	PFBX1193Z1	PUSH BUTTON,STP	ABS-HB
15	PFBC1101Z1	PUSH BUTTON,COPY START	ABS-HB
16	PFBC1099Z1	PUSH BUTTON,START	ABS-HB
17	PFBX1190Z1	PUSH BUTTON,DIAL	ABS-HB
18	PFGP1234W1	PANEL,LCD	
19	PFGV1015Z	COVER,TEL CARD	
20	PFGD1050Z	CARD,TEL NO	
21	PFGG1190Z1	GRILL,SUB	PS-HB
22	PFGB1003Z3	BADGE	
23	PFGX1009Z	RING,NAVI	ABS-HB
24	PFGG1189S1	GRILLE,OPERATION	PS-HB

12.1.2. OPERATION COVER SECTION (2)

Ref. No.	Part No.	Part Name & Description	Remarks
30	PFUS1444Z	SPRING,ERATH DOC.A	
31	PFDG1320Z	GEAR,DOC.FEED ROLLER	POM
32	PFDJ1006Z	SPACER,ROLLER	POM
33	PFDN1066Z	ROLLER	
34	PFUS1506Z	SPRING	
35	PFHG1104Y	RUBBER,SEPARATION	
36	PFUS1437Y	LEAF SPRING	
37	PFUS1443Z	SPRING,EARTH OP B	
38	PFHX1679Z	COVER,SHEET	
39	PFJV1003Z	COVER,DISCHARGE BRUSH	
40	PFUV1065X	COVER,OPERATION PANEL	PS-HB
41	PFDE1209Z	LEVER,DOC,DETECTION	POM
42	PFUS1445Z	SPRING,EARTH DOCUMENT B	
43	PFUS1447Z	SPRING,EARTH DOC ROLLER	
44	PFUS1442Z	SPRING,EARTH OP A	

12.1.3. OPERATION COVER SECTION (3)

Ref. No.	Part No.	Part Name & Description	Remarks
50	PFDS1010Z	ROLLER,SEPARATION	POM
51	PFDJ1063Y	SPACER,SEPARATION ROLLER	POM
52	PFDE1198Z	ARM	POM
53	PFDG1189Z	GEAR	
54	PFDG1295Z	GEAR	POM
55	PFUS1422Z	COIL SPRING ,LOCK ARM	
56	PFDE1199Z	ARM,LOCK	POM
57	PFDE1200Y	SPACER,LOCK ARM	POM
58	PFDG1296Z	GEAR,SEPARATION	POM
59	PFJS07P32Z	CONNECTOR,7P	
60	N2GZBE000006	CIS(CONTACT IMAGE SENSOR)	
61	PFUS1440Y	COIL SPRING,CIS	
62	PFDF1098Z	SHAFT,SUPPORT ROLLER	
63	PFDR1044Y	ROLLER ,DOC.SUPPORT	POM
64	PFUS1441Y	COIL SPRING,SUPPOR ROLLER	
65	PFUG1017Z	GUIDE,MIDDLE	PS-HB
66	PFDG1297Z	GEAR	POM
67	PFDG1298Z	GEAR	POM
68	PFDE1201X	ARM	
69	PFUS1019Z	TORSION SPRING	
70	PFDG1299Z	GEAR	POM
71	PFDJ1042Z	SPACER,TRANSFER ROLLER	
72	PFUS1269Y	COIL SPRING	
73	PFDS1009Z	ROLLER,TRANSFER	
74	PFDG1294Z	GEAR	POM
75	PFMH1124Z	METAL PARTS	
76	PFZX2FL511M	TRAY,DOCUMENT	
77	PFDJ1051X	SPACER	

12.1.4. PICK UP SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
90	PFKE1029Y1	TRAY,PICK UP ROLLER	PS-HB
91	PFKV1075Z1	COVER,TRAY	PS-HB
92	PFQT2097W	LABEL,PAPER SET	
93	PFKS1084Z1	TRAY ,LIFT PAPER	PS-HB
94	PFHG1154Z	RUBBER,LIFT PLATE	
95	PFUS1424Z	SPRING,PLATE LIFT	
96	PFHR1370Z	CASE,SEPARATION PAPER	ABS-HB
97	PFUS1425Z	SPRING,PAPER SEPARATION	
98	PFHR1371Z	SHEET,PAPER	POM
99	PFHG1155Z	RUBBER,SEPARATION PAPER	
100	PFKE1028X1	TRAY,BOTTOM	PS-HB
101	PFDG1300Z	GEAR,PICK UP PAPER	POM
102	PFUS1423Z	SPRING,LIFT LOCK	
103	PFHR1368Z	LEVER,LOCK LIFT L	POM
104	PFHR1369Z	LEVER,LOCK LIFT R	POM
105	PFDJ1038Z	SPACER,PICK UP PAPER	POM
106	PFDR1018Z	ROLLER,PICK UP GUIDE	POM
107	PFDN1048Z	ROLLER,PICK UP	
108	PFDR1041Z	ROLLE,PICK UP PAPER	ABS-HB

12.1.5. FUSER SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
120	PFDS1014Z	ROLLER,PRESSURE PFA	
121	PFDJ1066Y	SPACER,PRESSURE ROLLER	
122	PFUS1426Z	COIL SPRING	
123	PFUA1044Z	CHASSIS,FUSER	PBT+ABS
124	A4DP7K000001	HEATER	
125	PFDG1301Z	GEAR,HEAT ROLLER	
126	PFDJ1065Z	SPACER,HEAT ROLLER A	
127	PFDS1011Y	ROLLER,HEAT	
128	PFDJ1064Z	SPACER,HEAT ROLLER A	
129	PFJT1023Z	TERMINAL PLATE,WIRE B	
130	PFDE1207Z	LEVER,EXIT SENSOR	
131	PFTA1001Z	THERMOSTAT,FUSER	
132	PFMH1085Z	METAL PARTS,HEATER	
133	PFJT1021Z	TERMINAL PLATE,FUSER	
134	PFRT003	SENSOR	S
135	PFJT1022Z	TERMINAL PLATE,WIRE A	
136	PFHR1408Z	LEVER	
137	PFDG1302Z	GEAR,EJECT IDLER	POM
138	PFUA1043X	CHASSIS,FUSER	PBT+ABS
139	PFUS1435Z	SPRING,SUPPORT EJECT	
140	PFDR1043Z	ROLLER,SUPPORT EJECT	POM
141	PFHR1372Y	LEVER	ABS
142	PFDR1042X	ROLLER,EJECT	POM

12.1.6. UPPER MAIN CABINET SECTION

Ref. No.	Part No.	Part Name & Description	Remarks
150	XUC2FY	RETAINING RING	
151	PFDG1201Z	GEAR,FEED ROLLER	POM
152	PFUS1325Z	SPRING	
153	PFDJ1067Z	SPACER,FEED ROLLER	POM
154	PFDN1065Z	ROLLER,FEED	
155	PFDJ1044Z	SPACER	POM
156	PFDE1203Z	LEVER	ABS
157	PFQT2076W	INDICATION PLATE-LABEL	
158	PFDE1204W	LEVER	POM
159	PFDF1097Z	SHAFT	
160	PQDR9685Y	ROLLER	POM
161	PFUS1275Z	COIL SPRING	
162	PFGT2261Z-M	NAME PLATE, AL	
163	PFUE1022Z	CASE,COVER	
164	PFUS1448Z	LEAF SPRING	
165	PF0G1006Z	MIRROR	
166	PFQT2077Z	LABEL	

12.1.7. LOWER MAIN CABINET SECTION (1)

Ref. No.	Part No.	Part Name & Description	Remarks
180	PFMD1065Z	COVER	
181	PFHG1169Z	RUBBER PARTS,FOOT	
182	LPA1603K	LASER UNIT	⚠
183	PQLB1E1	INSULATOR	
184	PFJP03S04Z	AC SOCKET	⚠S
185	PQMX10010Z	CASE,COVER	
186	PQHR945Z	BAND	
187	PFJS02P02Z	CONNECTOR	
188	KR06TT251508	INSULATOR	
189	WLR18YK26CM4	LEAD WIRE	
190	PFJS02P34Z	CONNECTOR	
191	PFJS08P31Z	CONNECTOR	
192	PFJE1021Z	LEAD WIRE	
193	PFJS06P30Z	CONNECTOR,6P	
194	PFUS1431Z	COIL SPRING	
195	PFJS04P28Z	CONNECTOR	
196	PFJS05P29Z	CONNECTOR,5P	
197	PFUS1449Z	COIL SPRING	
198	XWC4B	WASHER	

12.1.8. LOWER MAIN CABINET SECTION (2)

Ref. No.	Part No.	Part Name & Description	Remarks
210	PFUE1015Z	PLASTIC PARTS	ABS
211	PFUS1450Z	TORSION SPRING	
212	WLL20YG24M3M	LEAD WIRE	
213	PFUS1028Z	LEAF SPRING	
214	PF0M1005Z	MIRROR	
215	PFUS1429Z	LEAF SPRING	
216	PFUS1439Z	COIL SPRING	
217	PFUS1502Z	TORSION SPRING	
218	PFJS02P12Z	CONNECTOR	
219	PFAS50P006Z	SPEAKER	
220	PFUS1456Z	TORSION SPRING	
221	PFDG1310Z	GEAR,IDLER	POM
222	PFDG1311Z	GEAR,IDLER	POM
223	PFKF1058Z1	CABINET COVER,HANDSET	PS
224	PFBH1024Z1	PUSH BUTTON,HOOK	ABS-HB
225	PFKM1115Z1	CABINET BODY,HANDSET	PS
226	PFHX1657Z	SPACER	
227	PFUA1045Z	CHASSIS,GERA MAIN	
228	55SPM25D3NA	DC MOTOR	
229	PFDG1304Y	GEAR,IDLER 67	POM
230	XUC4FY	E-RING	
231	PFDG1306Y	GEAR,FISER IDLER 2	POM
232	PFDG1305Z	GEAR,FUSER IDLER	POM
233	PFDG1303Z	GEAR,IDLER	POM
234	XUC5FY	RETAINING RING	
235	PFKM1114Z1	CABINET BODY,MAIN	PS
236	PFHX1674Z	COVER,PROTECTION SHEET	
237	PFHX1668Z	COVER,CABINET SHEET	

12.1.9. LOWER CABINET SECTION (3)

Ref. No.	Part No.	Part Name & Description	Remarks
240	PFMH1125Z	PLATE,MOTOR	
241	PFJQ35S1S15D	DC MOTOR	S
242	PFDE1201X	ARM	POM
243	PFUS1019Z	SPRING	
244	PFDG1299Z	GEAR,PLANET	POM
245	PFDG1297Z	GEAR,IDLER	POM
250	PFUA1046Z	CHASSIS	PBT+ABS
251	PFDG1297Z	GEAR,IDLER	
252	PFDG1307Z	GEAR,PICK CLUTCH B	POM
253	PFDG1189Z	GEAR	
254	PFDG1308Z	GEAR	POM
255	PFDG1309Z	GEAR,PICK CLUTCH A	POM
256	PFDG1176Z	GEAR,IDLER B	
257	PFHG1165Z	RUBBER,SOLENOID	
258	PFDE1202Z	LEVER,PICK UP CLUTCH	POM
259	PFUS1259Y	SPRING,SOLENOID	
260	PFFP1003Z	PLUNGER,SOLENOID	
261	PFUA1047Z	CHASSIS,GERA CHASSIS	ABS
270	PFUS1430Z	SPRING,TERMINAL TRS	
271	PFUV1059Y	CASE,FAN	PS
272	PFUS1451Z	SPRING,COVER OPEN	
273	PFUE1016Z	LEVER	ABS
274	L6FALDGK0001	MOTOR,FAN	
275	PFUS1428Z	LEAF SPRING,TERMINAL DEV	
276	PFUS1427Z	LEAF SPRING	

12.2. ACCESSORIES AND PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PFQW2030Z	LEAFLET	
A2	PFKS1096Z1	TRAY,PAPER STACKER	
A3	PQJA10038Y	CORD,POWER	⚠
A4	PFJA02B002Z	CORD,TEL	
A5	PFJA1029Z	CORD,CURL	
A6	PFZXFL511M	GUIDE	
A7	PFKS1085Z1	TRAY,PAPER TRAY	PS-HB
A8	PFQX1907Y	INSTRUCTION BOOK	
A9	PFQW2049Y	Q.R.G(ARABIC)	
A9	PFQW2050Y	Q.R.G(PERSIAN)	
A9	PFQW2051Y	Q.R.G(THAI)	
A10	PFJXE1005Z	HANDSET	⚠
P1	PFZE1132Z-M	GIFT BOX	
P2	PFPN1307Z	CUSHION	
P3	PFPN1308Y	CUSHION	
P4	PFPN1305Y	CUSHION	
P5	PFPN1306Y	CUSHION	
P6	PFPD1165Y	CUSHION	
P7	PFPH1040Y	PROTECTION COVER	
P8	XZB20X35A04	PROTECTION COVER	
P9	XZB32X45A04	PROTECTION COVER	
P10	PFPH1046Z	PROTECTION COVER	

12.3. DIGITAL BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PFWP1FL511E	DIGITAL BOARD ASS'Y (RTL)	
		(ICs)	
IC600	PFVIR676811	IC	
IC602	C1CB00001637	IC	
IC604	C3ABPG000102	IC	
IC605	C1CB00001566	IC	
IC606	C1CB00001551	IC	
IC607	PFWIFL511E	IC(ROM)	
IC608	C0DBFGD00012	IC	
IC609	C0GBH0000015	IC	
IC610	PFVIT2003APS	IC	S
IC611	C0JBAR000386	IC	
		(TRANSISTORS)	
Q602	PQVTDTC143E	TRANSISTOR(SI)	S
Q603	2SB1197K	TRANSISTOR(SI)	S
Q604	PQVTDTC143E	TRANSISTOR(SI)	S
Q605	2SB1197K	TRANSISTOR(SI)	S
Q606	PQVTDTC143E	TRANSISTOR(SI)	S
Q607	2SB1197K	TRANSISTOR(SI)	S
Q609	2SD1819A	TRANSISTOR(SI)	S
Q612	PQVTD143Z106	TRANSISTOR(SI)	S
Q613	PQVTD143Z106	TRANSISTOR(SI)	S
Q614	2SD1819A	TRANSISTOR(SI)	S
Q615	PQVTDTC143E	TRANSISTOR(SI)	S
Q616	PQVTDTC143E	TRANSISTOR(SI)	S
Q617	PQVTD143Z106	TRANSISTOR(SI)	S
Q618	2SD1819A	TRANSISTOR(SI)	S

Ref. No.	Part No.	Part Name & Description	Remarks
Q619	2SB1197K	TRANSISTOR(SI)	S
Q620	2SB1322	TRANSISTOR(SI)	S
Q621	PQVTD143Z106	TRANSISTOR(SI)	S
Q622	PQVTD143Z106	TRANSISTOR(SI)	S
Q623	PQVTDTC143E	TRANSISTOR(SI)	S
		(DIODES)	
D600	PQVDRLS73T	DIODE(SI)	S
D601	PQVDNNCD56DT	DIODE(SI)	S
D602	PFVDRMRLS245	DIODE(SI)	S
D606	B0JAME000005	DIODE(SI)	
D607	MA7160	DIODE(SI)	S
D608	PFVDRMRLS245	DIODE(SI)	S
		(BATTERY)	
BAT600	CR-2032/V9A	LITHIUM BATTERY	
		(CONNECTORS)	
CN600	PQJS28X59Z	CONNECTOR,28P	
CN601	PQJP4G30Z	CONNECTOR,4P	S
CN602	PQJP3G30Z	CONNECTOR,3P	S
CN603	PQJP02G100Z	CONNECTOR,2P	
CN604	PQJP5G30Z	CONNECTOR,5P	S
CN606	PQJP8G30Z	CONNECTOR,8P	S
CN607	PQJS08X53Z	CONNECTOR,8P	
CN608	PQJP7G30Z	CONNECTOR,7P	S
CN609	PQJP4G30Z	CONNECTOR,4P	S
CN610	PQJP5G30Z	CONNECTOR,5P	S
CN611	PQJP05G100Z	CONNECTOR,5P	
CN612	PQJP08G100Z	CONNECTOR,8P	
CN613	PQJP8G30Z	CONNECTOR,8P	S
CN614	PQJP6G30Z	CONNECTOR,6P	S
		(FUSES)	
F600	PFRB0031063	FUSE	
F602	PFRB0031063	FUSE	
F603	PFRB0031031T	FUSE	S
F604	PFRB0032315T	FUSE	S
F605	PFRB002122KZ	FUSE	S
F606	PFRB0031200	FUSE	S
		(CRYSTAL OSCILLATORS)	
X600	PFVC32256ZAT	CRYSTAL OSCILLATOR	S
X601	PFVCK3.6N9Z	CRYSTAL OSCILLATOR	S
X602	PFVCCSA24Z	CRYSTAL OSCILLATOR	S
X603	H0A327200079	CRYSTAL OSCILLATOR	
		(COILS)	
L601	PFVF1B102SP	COIL	
L602	PFVF1B102SP	COIL	
L603	PFVF1B102SP	COIL	
L604	PFVF1B102SP	COIL	
L605	PFVF1B102SP	COIL	
L606	PFVF1B102SP	COIL	
L607	PQLQR2BT	COIL	S
L610	PQLQR2BT	COIL	S
L612	PQLQR2BT	COIL	S
L613	PQLQR2BT	COIL	S
L614	PQLQR1ET	COIL	S
L615	PQLQR2BT	COIL	S

Ref. No.	Part No.	Part Name & Description	Remarks
L616	PQLQR1ET	COIL	S
L630	PFVF2P221SG	COIL	S
L631	PQLQR2BT	COIL	S
L634	PQLQR2KA20T	COIL	S
L635	PQLQR2KA20T	COIL	S
L636	PQLQR2KA20T	COIL	S
L648	PQLQR2BT	COIL	S
L649	PFVF2P221SG	COIL	S
L650	PFVF2P221SG	COIL	S
L651	PFVF2P221SG	COIL	S
L652	PFVF2P221SG	COIL	S
L653	PFVF1B102SP	COIL	
L654	PFVF1B102SP	COIL	
L655	PFVF1B102SP	COIL	
L656	PFVF1B102SP	COIL	
L657	PFVF1B102SP	COIL	
L658	PFVF1B102SP	COIL	
L659	PFVF1B102SP	COIL	
L660	PFVF1B102SP	COIL	
L661	PFVF1B102SP	COIL	
R663	PQLQR2KA20T	COIL	S
R759	PQLQR2KA20T	COIL	S
R760	PQLQR2KA20T	COIL	S
		(CERAMIC FILTERS)	
L608	PFVF1B601ST	CERAMIC FILTER	S
L618	PFVF1B252SDT	CERAMIC FILTER	S
L619	PFVF1B252SDT	CERAMIC FILTER	S
L620	PFVF1B252SDT	CERAMIC FILTER	S
L621	PFVF1B252SDT	CERAMIC FILTER	S
L627	PFVF1B252SDT	CERAMIC FILTER	S
L628	PFVF1B252SDT	CERAMIC FILTER	S
L633	PFVF1A102ST	CERAMIC FILTER	
L637	PFVF1A102ST	CERAMIC FILTER	
L638	PFVF1A102ST	CERAMIC FILTER	
L639	PFVF1A102ST	CERAMIC FILTER	
L641	PFVF1B601ST	CERAMIC FILTER	S
L642	PFVF1B252SDT	CERAMIC FILTER	S
L643	PFVF1B252SDT	CERAMIC FILTER	S
L644	PFVF1B252SDT	CERAMIC FILTER	S
L645	PFVF1B601ST	CERAMIC FILTER	S
L646	PFVF1B601ST	CERAMIC FILTER	S
L647	PFVF1B252SDT	CERAMIC FILTER	S
		(PHOTO ELECTRIC TRANSDUCERS)	
PS600	PFVIRM574SL	PHOTO SENSOR	S
PS601	PFVIRM574SL	PHOTO SENSOR	S
		(COMPONENTS PARTS)	
L632	EXCELDR35	RESISTOR ARRAY	
RA600	PFXBV8V101JV	RESISTOR ARRAY	S
RA601	PFXBV8V101JV	RESISTOR ARRAY	S
RA602	PFXBV8V101JV	RESISTOR ARRAY	S
RA603	EXB38V220JV	RESISTOR ARRAY	S
RA604	EXB38V220JV	RESISTOR ARRAY	S
RA605	EXB38V220JV	RESISTOR ARRAY	S
RA606	EXB38V220JV	RESISTOR ARRAY	S

Ref. No.	Part No.	Part Name & Description	Remarks
RA607	EXB38V220JV	RESISTOR ARRAY	S
RA608	EXB38V220JV	RESISTOR ARRAY	S
RA609	EXB38V220JV	RESISTOR ARRAY	S
RA610	EXB38V220JV	RESISTOR ARRAY	S
RA611	EXB38V220JV	RESISTOR ARRAY	S
RA612	EXB38V220JV	RESISTOR ARRAY	S
RA613	EXRV8V470JV	RESISTOR ARRAY	S
RA614	EXRV8V470JV	RESISTOR ARRAY	S
RA615	EXRV8V470JV	RESISTOR ARRAY	S
RA616	EXRV8V470JV	RESISTOR ARRAY	S
RA617	EXRV8V470JV	RESISTOR ARRAY	S
RA618	EXRV8V470JV	RESISTOR ARRAY	S
RA619	EXRV8V470JV	RESISTOR ARRAY	S
RA620	EXRV8V470JV	RESISTOR ARRAY	S
RA621	EXRV8V470JV	RESISTOR ARRAY	S
		(RESISTORS)	
L609	PQ4R10XJ000	0	S
L611	PQ4R10XJ000	0	S
L617	PQ4R10XJ000	0	S
L622	PQ4R10XJ000	0	S
L640	PQ4R10XJ000	0	S
L623	ERJ3GEYJ271	270	
L624	ERJ3GEYJ271	270	
L625	ERJ3GEYJ271	270	
L626	ERJ3GEYJ271	270	
R601	ERG2SJ271	270	
R602	ERJ3GEYJ103	10k	
R603	ERJ3GEYJ563	56k	
R607	ERJ3GEYJ562	5.6k	
R608	ERJ3GEYJ562	5.6k	
R609	ERJ3GEYJ562	5.6k	
R610	ERJ3GEYJ562	5.6k	
R611	PQ4R10XJ331	330	S
R612	ERJ3GEYJ103	10k	
R613	ERJ3GEYJ563	56k	
R614	ERJ3GEYJ472	4.7k	
R615	ERJ3GEYJ563	56k	
R616	ERJ3GEYJ562	5.6k	
R617	PQ4R10XJ331	330	S
R618	D0GG472JA002	4.7k	
R619	ERJ3GEYJ101	100	
R620	ERJ3GEYJ563	56k	
R621	ERJ12YJ390	39	
R622	D0GG472JA002	4.7k	
R623	ERJ3GEYJ103	10k	
R624	ERJ3GEYJ103	10k	
R625	D0GG472JA002	4.7k	
R626	ERJ3GEYJ103	10k	
R627	ERJ3GEYJ102	1k	
R628	ERJ3GEYJ103	10k	
R629	ERJ3GEYJ101	100	
R630	PQ4R10XJ331	330	S
R631	ERJ3GEYJ563	56k	
R632	ERJ3GEYJ562	5.6k	

Ref. No.	Part No.	Part Name & Description	Remarks
R633	ERJ3GEYF393	39k	S
R634	ERJ3GEYF393	39k	S
R635	ERJ3EKF2202	220k	
R636	ERJ3EKF2202	220k	
R637	ERJ3EKF1802	180k	
R638	ERJ3EKF3302	330k	
R640	ERJ3GEYJ101	100	
R641	ERJ3GEYJ101	100	
R642	ERJ3GEYJ101	100	
R643	ERJ3GEYJ181	180	
R644	ERJ3GEYJ102	1k	
R645	ERJ3GEYJ103	10k	
R647	ERJ3GEYJ473	47k	
R649	ERJ3GEYJ473	47k	
R650	ERJ3GEYJ473	47k	
R652	ERJ3GEYJ101	100	
R653	ERJ3GEYJ101	100	
R654	ERJ3GEYJ103	10k	
R655	ERJ3GEYJ272	2.7k	
R656	ERJ3GEYJ222	2.2k	
R657	ERJ3GEYJ102	1k	
R658	ERJ3GEYJ102	1k	
R659	ERJ3GEYJ391	390	
R660	ERJ3GEYJ472	4.7k	
R664	ERJ3GEYJ203	20k	
R668	ERJ3GEY0R00	0	
R675	ERJ3GEYJ473	47k	
R678	ERJ3GEYJ470	47	
R679	ERJ3GEYJ105	1M	
R680	ERJ3GEY0R00	0	
R681	ERJ3GEY0R00	0	
R682	ERJ3GEY0R00	0	
R683	ERJ3GEYJ220	22	
R687	ERJ3GEYJ473	47k	
R688	ERJ3GEYJ473	47k	
R690	ERJ3GEYJ101	100	
R691	ERJ3GEYJ101	100	
R695	ERJ3GEYJ220	22	
R696	ERJ3GEYJ220	22	
R697	ERJ3GEYJ220	22	
R698	ERJ3GEYJ220	22	
R701	ERJ3GEYJ473	47k	
R704	ERJ3GEYJ475	4.7M	
R705	ERJ3GEYJ4R7	4.7	
R707	ERJ3GEYJ334	330k	
R708	ERJ3GEYJ222	2.2k	
R709	ERJ3GEYJ472	4.7k	
R710	ERJ3GEYJ4R7	4.7	
R716	ERJ3GEY0R00	0	
R719	ERJ3GEYJ183	18k	
R721	ERJ3GEY0R00	0	
R722	ERJ3EKF1101	1.1	
R723	ERJ3EKF3602	360k	
R724	ERJ8GEYJ2R2	2.2	

Ref. No.	Part No.	Part Name & Description	Remarks
R726	ERJ3GEYJ103	10k	
R727	ERJ3GEYJ101	100	
R728	ERJ3GEYJ101	100	
R729	PQ4R18XJ100	10	S
R730	ERJ3GEYJ472	4.7k	
R731	ERJ3GEYJ222	2.2k	
R732	ERJ3GEYJ333	33k	
R733	D0C1R47GA003	0.47	
R734	D0C1R47GA003	0.47	
R735	ERJ3GEYJ222	2.2k	
R736	ERJ3GEYJ102	1k	
R737	ERDS1VJ152	1.5k	S
R738	ERJ3GEYJ473	47k	
R739	ERJ3GEYJ101	100	
R740	ERJ3GEYJ473	47k	
R741	ERJ3GEYJ101	100	
R742	ERJ3GEYJ101	100	
R743	ERJ3GEYJ101	100	
R744	ERJ3GEYJ101	100	
R745	ERJ3GEYJ393	39k	
R746	ERJ3GEYJ103	10k	
R747	ERX1SJ2R2	2.2	
R748	ERJ3GEYJ472	4.7k	
R749	ERJ3GEYJ102	1k	
R750	ERJ3GEYJ102	1k	
R751	ERJ3GEYJ303	30k	
R752	ERJ3GEYJ683	68k	
R753	ERJ3GEYJ104	100k	
R754	ERJ3GEYJ473	47k	
R755	ERJ3GEYJ103	10k	
R756	ERJ3GEYJ562	5.6k	
R757	ERJ3GEYJ222	2.2k	
R758	ERJ3GEYJ183	18k	
R764	ERJ3GEYJ220	22	
R766	ERJ3GEY0R00	0	
R767	ERJ3GEYJ181	180	
R768	ERJ3GEYJ181	180	
R769	ERJ3GEYJ181	180	
R770	ERJ3GEYJ103	10k	
R771	ERJ3GEYJ273	27k	
R772	ERJ3GEYJ100	10	
R773	ERJ3GEYJ103	10k	
R775	ERJ3GEYJ103	10k	
R778	ERJ3GEYJ103	10k	
R780	ERJ3GEYJ181	180	
		(CAPACITORS)	
C600	ECUV1C104ZFV	0.1	
C601	ECEA1VKA101	100	S
C602	ECUV1C104ZFV	0.1	
C604	ECUV1H102KBV	0.001	
C605	ECUV1H102KBV	0.001	
C606	ECUV1H102KBV	0.001	
C607	ECUV1H102KBV	0.001	
C608	ECUV1H102KBV	0.001	

Ref. No.	Part No.	Part Name & Description	Remarks
C609	ECUV1H102KBV	0.001	
C610	ECUV1H102KBV	0.001	
C611	ECUV1H103KBV	0.01	
C612	ECUV1H103KBV	0.01	
C613	ECUV1C104KBV	0.1	
C614	ECUV1C104ZFV	0.1	
C615	ECUV1C104ZFV	0.1	
C616	ECEA1CKS100	10	S
C617	ECEA1CKS100	10	S
C618	ECEA1AU101	100	S
C619	ECUV1C104ZFV	0.1	
C621	ECUV1A105ZFV	1	
C622	ECUV1C104ZFV	0.1	
C623	ECUV1H102KBV	0.001	
C624	ECUV1H102KBV	0.001	
C625	ECUV1H102KBV	0.001	
C626	ECUV1H102KBV	0.001	
C627	ECUV1H102KBV	0.001	
C628	ECUV1C104ZFV	0.1	
C629	ECUV1C104KBV	0.1	
C630	ECUV1H103KBV	0.01	
C631	ECUV1H100DCV	10p	S
C632	ECUV1H100DCV	10p	S
C633	ECUV1C104ZFV	0.1	
C634	ECUV1H330JCV	33p	
C647	ECUV1C104ZFV	0.1	
C648	ECEA1VKA101	100	S
C652	ECUV1H222KBV	0.0022	
C654	ECUV1H222KBV	0.0022	
C655	ECUV1H120JCV	12p	
C656	ECUV1H150JCV	15p	
C659	ECUV1H150JCV	15p	
C661	ECUV1C104ZFV	0.1	
C662	ECUV1C104ZFV	0.1	
C663	ECUV1C104ZFV	0.1	
C664	ECUV1C104ZFV	0.1	
C665	ECUV1H270JCV	27p	
C666	ECUV1C104ZFV	0.1	
C667	ECUV1C104ZFV	0.1	
C668	ECUV1C104ZFV	0.1	
C669	ECUV1C104ZFV	0.1	
C670	ECUV1C104ZFV	0.1	
C671	ECUV1C104ZFV	0.1	
C672	ECUV1C104ZFV	0.1	
C673	ECUV1C104ZFV	0.1	
C674	ECUV1H150JCV	15p	
C675	ECUV1H150JCV	15p	
C676	ECUV1H150JCV	15p	
C677	ECUV1H270JCV	27p	
C678	ECUV1C104ZFV	0.1	
C679	ECUV1C104ZFV	0.1	
C680	ECUV1H270JCV	27p	
C681	ECUV1C104ZFV	0.1	
C682	ECUV1C104ZFV	0.1	

Ref. No.	Part No.	Part Name & Description	Remarks
C683	ECUV1C104ZFV	0.1	
C684	ECUV1C104ZFV	0.1	
C685	ECUV1H120JCV	12p	
C686	ECUV1H150JCV	15p	
C687	ECUV1C104ZFV	0.1	
C689	ECUV1C104ZFV	0.1	
C690	ECUV1C104ZFV	0.1	
C691	ECUV1H270JCV	27p	
C692	ECUV1C104ZFV	0.1	
C693	ECUV1C104ZFV	0.1	
C694	ECUV1C104ZFV	0.1	
C695	ECUV1C104ZFV	0.1	
C696	ECUV1C104ZFV	0.1	
C698	ECUV1C104KBV	0.1	
C699	ECUV1C104KBV	0.1	
C700	ECUV1C104KBV	0.1	
C701	ECUV1C104ZFV	0.1	
C702	ECUV1C104ZFV	0.1	
C703	ECUV1C104ZFV	0.1	
C704	ECUV1C104ZFV	0.1	
C705	ECUV1C104KBV	0.1	
C706	ECUV1C104KBV	0.1	
C708	ECUV1C104ZFV	0.1	
C710	ECUV1C104ZFV	0.1	
C711	ECUV1H332KBV	0.0033	
C712	ECUV1C104ZFV	0.1	
C713	ECUV1C104ZFV	0.1	
C716	ECUV1H102KBV	0.001	
C717	ECUV1C104ZFV	0.1	
C718	ECUV1H102KBV	0.001	
C719	ECUV1C104ZFV	0.1	
C720	ECEA1AU221	220	S
C721	ECUV1C104ZFV	0.1	
C723	ECEA1AU221	220	S
C724	PFCA1HYK331M	330p	S
C725	ECUV1H104ZFV	0.1	S
C726	ECUV1H104ZFV	0.1	S
C727	ECEA1VKA101	100	S
C729	ECUV1C104ZFV	0.1	
C730	ECUV1H104ZFV	0.1	S
C731	ECUV1C104ZFV	0.1	
C732	ECUV1H104ZFV	0.1	S
C733	ECEA1VKA101	100	S
C734	ECEA1AU101	100	S
C735	ECUV1C104ZFV	0.1	
C736	ECUV1C104ZFV	0.1	
C737	ECUV1C104ZFV	0.1	
C738	ECUV1H680JCV	68p	
C739	ECUV1C104ZFV	0.1	
C740	ECUV1H181JCV	180p	S
C741	ECUV1H181JCV	180p	S
C742	ECUV1C104ZFV	0.1	
C743	ECUV1H222KBV	0.0022	
C745	ECUV1H181JCV	180p	S

Ref. No.	Part No.	Part Name & Description	Remarks
C746	ECUV1H181JCV	180p	S
C747	ECUV1H181JCV	180p	S
C748	ECUV1H181JCV	180p	S
C749	ECUV1H104ZFV	0.1	S
C754	ECUV1C104KBV	0.1	
C755	ECUV1H101JCV	100p	
C756	ECUV1C104ZFV	0.1	
C757	ECUV1C104ZFV	0.1	
C758	ECEA1CKS100	10	S
C761	ECUV1H181JCV	180p	S

12.4. ANALOG BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB2	PFLP1481CX-A	ANALOG BOARD ASS'Y (RTL)	
		(ICs)	
IC200	C0ABEB000038	IC	
IC201	C0ABEB000038	IC	
IC202	C0AABB000025	IC	
IC204	C0ABEB000038	IC	
IC206	PQVIMC34119D	IC	S
IC207	AN6384SB	IC	
IC208	AN6123MS	IC	
		(TRANSISTORS)	
Q202	2SC2235	TRANSISTOR(SI)	S
Q207	2SB1218ARL	TRANSISTOR(SI)	
Q210	PQVTDTC143E	TRANSISTOR(SI)	S
Q211	2SA1627	TRANSISTOR(SI)	S
Q212	PQVTDTC143E	TRANSISTOR(SI)	S
Q213	2SB1218ARL	TRANSISTOR(SI)	
		(DIODES)	
D200	MA4056	DIODE(SI)	S
D201	MA4056	DIODE(SI)	S
D202	1SS133	DIODE(SI)	S
D203	1SS133	DIODE(SI)	S
D208	1SS133	DIODE(SI)	S
D209	1SS133	DIODE(SI)	S
D210	PFVDDGS1ZB60	DIODE(SI)	
D211	MA4056	DIODE(SI)	S
D212	MA4056	DIODE(SI)	S
D213	1SS133	DIODE(SI)	S
		(CONNECTORS & JACKS)	
CN200	PQJP02G100Z	CONNECTOR,2P	
CN201	PQJS28X59Z	CONNECTOR,28P	
CN202	PQJJ1TB18Z	JACK	S
CN203	PQJJ1TC5Z	JACK	S
CN204	PQJJ1TC5Z	JACK	S
		(COILS)	
FLT200	PFLE003	COIL	S
FLT201	PFLE126	COIL	S
L239	PQLQR1E32A07	COIL	S
L242	PQLQR1E32A07	COIL	S
L247	PQLQR1E32A07	COIL	S

Ref. No.	Part No.	Part Name & Description	Remarks
L248	PQLQR1E32A07	COIL	S
L277	PFVF1B102SP	COIL	
		(CERAMIC FILTERS)	
L200	PFVF1B252SDT	CERAMIC FILTER	S
L201	PFVF1B252SDT	CERAMIC FILTER	S
L202	PFVF1B252SDT	CERAMIC FILTER	S
L205	PFVF1B252SDT	CERAMIC FILTER	S
L206	PFVF1B252SDT	CERAMIC FILTER	S
L207	PFVF1B252SDT	CERAMIC FILTER	S
L208	PFVF1B252SDT	CERAMIC FILTER	S
L209	PFVF1B252SDT	CERAMIC FILTER	S
L211	PFVF1B252SDT	CERAMIC FILTER	S
L212	PFVF1B252SDT	CERAMIC FILTER	S
L213	PFVF1B252SDT	CERAMIC FILTER	S
L214	PFVF1B252SDT	CERAMIC FILTER	S
L216	PFVF1B252SDT	CERAMIC FILTER	S
L217	PFVF1B252SDT	CERAMIC FILTER	S
L218	PFVF1B252SDT	CERAMIC FILTER	S
L220	PFVF1B252SDT	CERAMIC FILTER	S
L221	PFVF1B252SDT	CERAMIC FILTER	S
L222	PFVF1B252SDT	CERAMIC FILTER	S
L223	PFVF1B252SDT	CERAMIC FILTER	S
L224	PFVF1B252SDT	CERAMIC FILTER	S
L225	PFVF1B252SDT	CERAMIC FILTER	S
L230	PFVF1B252SDT	CERAMIC FILTER	S
L232	PFVF1B252SDT	CERAMIC FILTER	S
L234	PFVF1B252SDT	CERAMIC FILTER	S
L235	PFVF1B252SDT	CERAMIC FILTER	S
L236	PFVF1B252SDT	CERAMIC FILTER	S
L237	PFVF1B252SDT	CERAMIC FILTER	S
L249	PFVF1B252SDT	CERAMIC FILTER	S
L250	PFVF1B252SDT	CERAMIC FILTER	S
L253	PFVF1B252SDT	CERAMIC FILTER	S
L255	PFVF1B252SDT	CERAMIC FILTER	S
L256	PFVF1B252SDT	CERAMIC FILTER	S
L257	PFVF1B252SDT	CERAMIC FILTER	S
L258	PFVF1B252SDT	CERAMIC FILTER	S
L259	PFVF1B252SDT	CERAMIC FILTER	S
L260	PFVF1B252SDT	CERAMIC FILTER	S
L261	PFVF1B252SDT	CERAMIC FILTER	S
L265	PFVF1B252SDT	CERAMIC FILTER	S
L285	PFVF1B252SDT	CERAMIC FILTER	S
L286	PFVF1B252SDT	CERAMIC FILTER	S
R219	PFVF1B252SDT	CERAMIC FILTER	S
		(FUSE)	
F200	PQBA1N10NMAL	FUSE	S
		(RELAY)	
RLY200	PFSL003Z	RELAY	S
		(SWITCH)	
SW200	PFSH1A011Z	SWITCH	
		(TRANSFORMERS)	
T201	PFLT8E003	TRANSFORMER	S
T202	PFLT8E004	TRANSFORMER	S
		(VARISTORS)	

Ref. No.	Part No.	Part Name & Description	Remarks
SA200	PQVDDSS301L	VARISTOR (SURGE ABSORBER)	S ⚠
SA201	PFRZ001Z	VARISTOR (SURGE ABSORBER)	S
ZNR200	ERZVA7D151	VARISTOR	
ZNR71	PFRV271NS05K	VARISTOR	
		(PHOTO ELECTRIC TRANSDUCERS)	
PC202	0N3131SKU	PHOTO COUPLER	S
PC203	0N3131SKU	PHOTO COUPLER	S
PC204	PQVITLP627	PHOTO COUPLER	S ⚠
PC205	PQVITLP620K	PHOTO COUPLER	S
		(RESISTORS)	
J200	ERJ3GEY0R00	0	
J201	ERJ3GEY0R00	0	
J202	ERJ3GEY0R00	0	
J211	ERJ3GEY0R00	0	
J212	ERJ3GEY0R00	0	
J213	ERJ3GEY0R00	0	
L226	ERJ3GEY0R00	0	
L227	ERJ3GEY0R00	0	
L228	ERJ3GEY0R00	0	
L231	ERJ3GEY0R00	0	
L240	ERJ3GEY0R00	0	
L241	ERJ3GEY0R00	0	
L262	ERJ3GEY0R00	0	
L263	ERJ3GEY0R00	0	
L264	ERJ3GEY0R00	0	
L266	ERJ3GEYJ101	100	
L267	ERJ3GEYJ101	100	
L268	ERJ3GEY0R00	0	
L270	ERJ3GEYJ101	100	
L271	ERJ3GEYJ101	100	
L274	ERJ3GEYJ101	100	
L275	ERJ3GEYJ101	100	
L276	ERJ3GEY0R00	0	
L278	ERJ3GEY0R00	0	
L279	ERJ3GEY0R00	0	
L280	ERJ3GEY0R00	0	
L283	ERJ3GEY0R00	0	
L287	ERJ3GEYJ331	330	
R200	ERJ3GEYJ103	10k	
R201	ERJ3GEYJ622	6.2k	
R202	ERJ3GEYJ153	15k	
R203	ERJ3GEYJ333	33k	
R205	ERJ3GEYJ103	10k	
R206	ERJ3GEYJ333	33k	
R207	ERJ3GEYJ752	7.5k	
R209	ERJ3GEYJ103	10k	
R214	ERJ3GEYJ103	10k	
R215	ERJ3GEYJ104	100k	
R216	ERJ3GEYJ104	100k	
R217	ERJ3GEYJ103	10k	
R218	ERJ3GEYJ114	110k	
R221	ERJ3GEYJ103	10k	
R222	ERJ3GEYJ134	130k	
R226	PQ4R18XJ100	10	S

[illegible]	[illegible]	[illegible]	[illegible]

Ref. No.	Part No.	Part Name & Description	Remarks
R229	ERJ3GEYJ473	47k	
R230	ERJ3GEYJ511	510	
R231	ERJ3GEYJ621	620	
R232	ERJ3GEYJ183	18k	
R233	ERJ3GEY0R00	0	
R234	ERJ3GEY0R00	0	
R236	ERJ3GEYJ473	47k	
R237	ERJ3GEYJ154	150k	
R238	ERJ3GEYJ124	120k	
R240	ERJ3GEYJ100	10	
R241	ERJ3GEYJ102	1k	
R242	ERJ3GEYJ334	330k	
R243	ERJ3GEYJ102	1k	
R244	ERJ3GEY0R00	0	
R245	ERJ3GEYJ472	4.7k	
R246	ERJ3GEYJ103	10k	
R247	ERJ3GEYJ103	10k	
R248	ERJ3GEYJ222	2.2k	
R250	ERJ3GEYJ102	1k	
R251	ERJ3GEYJ103	10k	
R253	ERJ3GEYJ123	12k	
R266	ERJ3GEYJ103	10k	
R268	ERJ3GEYJ103	10k	
R270	ERJ3GEYJ562	5.6k	
R275	ERJ3GEYJ821	820	
R276	ERJ3GEYJ223	22k	
R277	ERJ3GEYJ563	56k	
R278	ERDS2TJ150	15	S
R279	ERJ3GEYJ102	1k	
R280	ERJ3GEYJ101	100	
R281	ERJ3GEYJ394	390k	
R282	ERJ3GEYJ244	240k	
R283	ERJ3GEYJ134	130k	
R284	ERJ3GEYJ392	3.9k	
R285	ERJ3GEYJ183	18k	
R287	ERJ3GEYJ472	4.7k	
R288	ERJ3GEYJ102	1k	
R289	ERJ3GEYJ104	100k	
R291	ERJ3GEYJ124	120k	
R293	ERJ3GEYJ683	68k	
R295	ERJ3GEYJ224	220k	
R296	ERJ3GEYJ224	220k	
R297	ERJ3GEYJ224	220k	
R298	ERJ3GEYJ154	150k	
R299	ERDS1TJ682	6.8k	S
R300	ERJ3GEYJ820	82	
R301	ERJ3GEYJ820	82	
R302	ERJ3GEYJ820	82	
R303	ERJ3GEYJ822	8.2k	
R304	ERJ3GEYJ222	2.2k	
R305	ERJ3GEYJ473	47k	
R308	ERJ3GEY0R00	0	
R310	ERDS1TJ6R8	6.8	S
R312	ERJ3GEYJ681	680	

Ref. No.	Part No.	Part Name & Description	Remarks
R313	ERJ3GEYJ182	1.8k	
R314	ERJ3GEYJ182	1.8k	
R315	ERDS1VJ333	33k	S
R316	ERJ3GEYJ103	10k	
R317	ERJ3GEYJ563	56k	
R318	ERJ3GEYJ103	10k	
R319	ERJ3GEYJ563	56k	
R320	ERJ3GEYJ100	10	
R324	ERJ3GEYJ114	110k	
R325	ERJ3GEYJ334	330k	
R326	ERJ3GEYJ134	130k	
R327	ERJ3GEYJ223	22k	
R328	ERJ3GEYJ104	100k	
R329	ERJ3GEYJ103	10k	
R330	ERJ3GEYJ105	1M	
R331	ERJ3GEYJ154	150k	
R332	ERJ3GEYJ183	18k	
R334	ERJ3GEYJ243	24k	
R335	ERJ3GEYJ243	24k	
R340	ERJ3GEYJ4R7	4.7	
R341	ERJ3GEYJ101	100	
R342	ERJ3GEYJ4R7	4.7	
R343	ERJ3GEYJ102	1k	
R344	ERJ3GEYJ103	10k	
		(CAPACITORS)	
C200	ECUV1C104KBV	0.1	
C201	ECUV1H621JCV	620p	
C202	ECUV1H333KBV	0.033	S
C203	ECUV1H562KBV	0.0056	
C204	ECUV1H471JCV	470p	S
C205	ECUV1H621JCV	620p	
C206	ECUV1H621JCV	620p	
C207	ECUV1H272KBV	0.0027	
C208	ECUV1H102KBV	0.001	
C209	ECUV1H153KBV	0.015	
C212	ECUV1H392KBV	0.0039	
C213	ECUV1H392KBV	0.0039	
C214	ECJ1VC1H151J	150p	
C216	ECUV1C104ZFV	0.1	
C218	ECEA1CKS100	10	S
C219	ECUV1H271JCV	270p	S
C221	ECUV1C104ZFV	0.1	
C222	ECEA1VU101	100	S
C223	ECUV1C273KBV	0.027	
C224	ECUV1C104KBV	0.1	
C227	ECUV1A224KBV	0.22	
C229	ECUV1H680JCV	68p	
C230	ECUV1C104KBV	0.1	
C231	ECUV1H681JCV	680p	S
C232	ECUV1C273KBV	0.027	
C234	ECEA1CK101	100	S
C236	ECUV1H681JCV	680p	S
C237	ECEA1HKS4R7	4.7	S
C240	ECUV1H222KBV	0.0022	

Ref. No.	Part No.	Part Name & Description	Remarks
C241	ECUV1H682KBV	0.0068	S
C242	ECUV1A105ZFV	1	
C243	ECUV1A105ZFV	1	
C244	ECUV1H100DCV	10p	S
C245	ECUV1H100DCV	10p	S
C246	ECUV1C473KBV	0.047	
C248	ECEA1CK470	47	S
C250	ECUV1H101JCV	100p	
C253	ECEA1HU2R2	2.2	S
C256	ECEA1CKS100	10	S
C260	ECUV1H103KBV	0.01	
C265	ECEA1HKS010	1	S
C266	ECUV1C104KBV	0.1	
C267	ECUV1H820JCV	82p	
C268	ECUV1H820JCV	82p	
C269	ECUV1H680JCV	68p	
C270	ECEA1HU101	100	S
C271	ECUV1H332KBV	0.0033	
C272	ECEA0JK221	220	S
C273	ECEA1CKS100	10	S
C274	ECUV1C104ZFV	0.1	
C275	ECUV1C104ZFV	0.1	
C276	ECUV1C104ZFV	0.1	
C277	ECUV1C104KBV	0.1	
C278	ECKD2H681KB	680p	S
C279	ECKD2H681KB	680p	S
C281	ECQE2E105KZ	1	S
C282	ECUV1H820JCV	82p	
C283	ECUV1H820JCV	82p	
C284	ECUV1H820JCV	82p	
C285	ECJ1VC1H151J	150p	
C286	ECUV1H681JCV	680p	S
C287	ECUV1H101JCV	100p	
C292	ECEA1HKS2R2	2.2	S
C293	ECUV1H103KBV	0.01	
C294	ECEA1CK470	47	S
C296	ECUV1H103KBV	0.01	
C297	ECUV1C104ZFV	0.1	
C298	ECEA1CK101	100	S
C299	ECUV1C123KBV	0.012	
C301	ECUV1H621JCV	620p	
C302	ECUV1C273KBV	0.027	
C303	ECJ1VC1H151J	150p	
C307	ECUV1H680JCV	68p	
C308	ECUV1H271JCV	270p	S
C309	ECUV1H822KBV	0.0082	S
C310	ECUV1C104ZFV	0.1	
C311	ECEA0JK331	330	S
C312	ECUV1C104ZFV	0.1	
C313	ECEA1CKS100	10	S
C314	ECUV1H472KBV	0.0047	S
C315	ECUV1H272KBV	0.0027	
C317	ECUV1C104KBV	0.1	
C318	ECUV1C104KBV	0.1	

Ref. No.	Part No.	Part Name & Description	Remarks
C320	ECUV1H103KBV	0.01	
C321	ECUV1H100DCV	10p	S
C323	ECEA1CK101	100	S
C324	ECUV1A224KBV	0.22	
C325	ECUV1C683KBV	0.068	
C326	ECUV1H100DCV	10p	S
C327	ECUV1C104ZFV	0.1	
C328	ECUV1A105ZFV	1	
C329	ECUV1A105ZFV	1	

12.5. OPERATION BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB3	PFWP2FL511M	OPERATION BOARD ASS'Y (RTL)	
PCB3-1	K0L1AA000001	SWITCH,SET	
		(IC)	
IC101	C1ZBZ0002089	IC	
		(DIODES)	
LED101	PQVDSLR325MC	LED	S
LED102	PQVDR325CA47	LED	S
D101	1SS133	DIODE(SI)	S
D102	1SS133	DIODE(SI)	S
D103	1SS133	DIODE(SI)	S
		(CONNECTOR)	
CN102	PQJP8G43Y	CONNECTOR,8P	S
		(LIQUID CRYSTAL DISPLAY)	
CN101	L5DAAFB00001	LCD	
		(PHOTO ELECTRIC TRANSDUCER)	
PS101	CNA1006N	PHOTO SENSOR	
		(THERMISTOR)	
TH101	D4CC11030019	THERMISTOR	
		(SWITCHES)	
SW101	EVQ11Y05B	SWITCH	
SW102	EVQ11Y05B	SWITCH	
SW103	EVQ11Y05B	SWITCH	
SW104	EVQ11Y05B	SWITCH	
SW105	EVQ11Y05B	SWITCH	
SW106	EVQ11Y05B	SWITCH	
SW107	EVQ11Y05B	SWITCH	
SW108	EVQ11Y05B	SWITCH	
SW109	EVQ11Y05B	SWITCH	
SW110	EVQ11Y05B	SWITCH	
SW111	EVQ11Y05B	SWITCH	
SW112	EVQ11Y05B	SWITCH	
SW113	EVQ11Y05B	SWITCH	
SW114	EVQ11Y05B	SWITCH	
SW115	EVQ11Y05B	SWITCH	
SW116	EVQ11Y05B	SWITCH	
SW117	EVQ11Y05B	SWITCH	
SW118	EVQ11Y05B	SWITCH	
SW119	EVQ11Y05B	SWITCH	
SW120	EVQ11Y05B	SWITCH	
SW121	EVQ11Y05B	SWITCH	

Ref. No.	Part No.	Part Name & Description	Remarks
SW122	EVQ11Y05B	SWITCH	
SW123	EVQ11Y05B	SWITCH	
SW124	EVQ11Y05B	SWITCH	
SW125	EVQ11Y05B	SWITCH	
SW126	EVQ11Y05B	SWITCH	
SW127	EVQ11Y05B	SWITCH	
SW128	EVQ11Y05B	SWITCH	
SW129	EVQ11Y05B	SWITCH	
SW130	EVQ11Y05B	SWITCH	
SW131	EVQ11Y05B	SWITCH	
SW132	EVQ11Y05B	SWITCH	
SW133	EVQ11Y05B	SWITCH	
SW134	EVQ11Y05B	SWITCH	
SW135	EVQ11Y05B	SWITCH	
SW136	EVQ11Y05B	SWITCH	
SW137	EVQ11Y05B	SWITCH	
SW138	EVQ11Y05B	SWITCH	
SW139	EVQ11Y05B	SWITCH	
SW140	EVQ11Y05B	SWITCH	
SW141	EVQ11Y05B	SWITCH	
SW142	EVQ11Y05B	SWITCH	
SW143	EVQ11Y05B	SWITCH	
SW144	EVQ11Y05B	SWITCH	
SW145	EVQ11Y05B	SWITCH	
SW146	K0L1AA000001	SWITCH	POM
		(RESISTORS)	
J164	ERJ3GEY0R00	0	
J165	ERJ3GEY0R00	0	
J166	ERJ3GEY0R00	0	
J167	ERJ3GEY0R00	0	
R102	ERJ3GEYJ123	12k	
R103	ERJ3GEYJ181	180	
R104	ERJ3GEYJ123	12k	
R105	ERJ3GEYJ181	180	
R106	ERJ3GEYJ123	12k	
R107	ERJ3GEYJ181	180	
R110	ERJ3GEYJ181	180	
R112	ERJ3GEYJ181	180	
R113	ERJ3GEYJ181	180	
R114	ERJ3GEYJ181	180	
R115	ERJ3GEYJ181	180	
R116	ERJ3GEYJ181	180	
R117	ERJ3GEYJ181	180	
R118	ERJ3GEYJ181	180	
R119	ERJ3GEYJ563	56k	
R120	ERJ3GEYJ331	330	
R121	ERJ3GEYJ472	4.7k	
R123	ERJ3GEYJ123	12k	
R127	ERJ3GEYJ103	10k	
R128	ERJ3GEYJ223	22k	
R129	ERJ3GEY0R00	0	
R130	ERJ3GEYJ101	100	
R131	ERJ3GEYJ101	100	
R133	ERJ3GEYJ122	1.2k	

Ref. No.	Part No.	Part Name & Description	Remarks
R134	ERJ3GEYJ101	100	
R135	ERJ3GEYJ101	100	
R138	ERJ3GEYJ331	330	
R139	ERJ3GEYJ331	330	
R146	ERJ3GEYJ101	100	
R147	ERJ3GEYJ123	12k	
R148	ERJ3GEYJ4R7	4.7	
R149	ERJ3GEYJ123	12k	
R152	ERJ3GEYJ181	180	
		(CAPACITORS)	
C103	ECEA1CK101	100	S
C104	ECUV1C104ZFV	0.1	
C105	ECUV1C104ZFV	0.1	
C106	ECUV1H103KBV	0.01	
C110	ECUV1C104ZFV	0.1	
C111	ECUV1C104ZFV	0.1	
C112	ECEA1CKS100	10	S
C115	ECUV1H101JCV	100p	
C117	ECUV1H101JCV	100p	
C118	ECUV1H101JCV	100p	
C119	ECUV1H103KBV	0.01	
C120	ECUV1C104ZFV	0.1	
C122	ECUV1C104ZFV	0.1	
C125	ECUV1C104ZFV	0.1	
C128	ECUV1H101JCV	100p	
C129	ECUV1H101JCV	100p	
C130	ECUV1H101JCV	100p	
C132	ECEA1CK101	100	S
C133	ECUV1C104ZFV	0.1	
C139	ECUV1C104ZFV	0.1	

12.6. HIGH VOLTAGE POWER SUPPLY BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB4	EUKMBN889HA	HIGH BOLTAGE POWER SUPPLY BOARD ASS'Y (RTL)	
		(IC)	
IC101	AN6742S	IC	
		(TRANSISTORS)	
Q101	2SB709A	TRANSISTOR(SI)	
Q102	2SB709A	TRANSISTOR(SI)	
Q103	2SD2137A	TRANSISTOR(SI)	
Q201	2SD2137A	TRANSISTOR(SI)	
Q202	2SA1699	TRANSISTOR(SI)	
		(DIODE)	
D104	PFVDDHM3FJ60	DIODE(SI)	S
D105	PFVDDHM3FJ60	DIODE(SI)	S
D107	PFVDERA1504	DIODE(SI)	S
D109	PFVDDHM3M20	DIODE(SI)	S
D201	PFVDERA1504	DIODE(SI)	S
D203	PFVDDHM3M20	DIODE(SI)	S
D204	PFVDERA1504	DIODE(SI)	S
D205	PFVDDHM3M20	DIODE(SI)	S
ZD201	PFVDRD62ESAB	ZENER DIODE	S
ZD202	PFVDRD150EB	ZENER DIODE	S
		(CONNECTOR)	
CN2	PFJP06B01Z	CONNECTOR,6P	
		(CAPACITORS)	
C101	PFEUKMG1V470	47	S
C102	ECQV1H473JZ	0.047	
C103	PFEUKMG1H2R2	2.2	S
C104	PFEUKMG1H010	1	S
C105	ECJ2VB1H103K	0.01	
C108	ECJ2FB1H473K	0.047	
C109	ECJ2VB1H153K	0.015	
C110	ECKK3F471KBP	470p	
C111	ECKK3D471KBB	470p	
C112	ECKK3D471KBB	470p	
C201	ECJ2FB1H473K	0.047	
C202	ECJ2VB1H102K	0.001	
C203	ECKK3D221KB	220p	
C204	ECJ2VB1H103K	0.01	
C205	ECKR2H102KB	0.001	
C207	ECKK3D102KB	0.001	
C209	ECKR2H101KB5	100p	
		(FUSE)	
IP101	PFBAICPN38	FUSE	S
		(RESISTORS)	
R101	PQ4R10XJ473	47k	S
R102	ERDS2TJ104	100k	
R104	ERDS2TJ103	10k	
R105	ERJ6ENF2003	200k	
R106	PQ4R10XJ103	10k	S
R107	ERDS2TJ103	10k	
R108	ERDS2TJ103	10k	
R109	ERDS2TJ272	2.7k	
R110	PQ4R10XJ103	10k	S
R111	PQ4R10XJ103	10k	S
R112	PQ4R10XJ103	10k	S

Ref. No.	Part No.	Part Name & Description	Remarks
R113	ERJ6ENF1004	1M	
R114	PQ4R10XJ103	10k	S
R116	PQ4R10XJ272	2.7k	S
R117	PQ4R10XJ000	0	S
R118	PQ4R10XJ000	0	S
R119	PFRGH16A306N	30M	S
R120	ERDS2TJ152	1.5k	
R121	ERDS2TJ152	1.5k	
R123	ER0S2TKF8451	8.45k	
R124	ERJ6ENF1003	100k	
R125	PQ4R10XJ000	0	S
R126	PQ4R10XJ102	1k	S
R127	PFRGVR25J106	10M	S
R202	ERJ6ENF4872	48.7k	
R203	PQ4R10XJ102	1k	S
R204	ERDS2TJ473	47k	
R205	ERDS1TJ224	220k	
R206	ER0S2TKF4532	45.3k	S
R207	PFRGR25F1504	1.5M	S
R208	PFRGVR25J105	1M	S
R209	PFRGVR25J105	1M	S
R210	ERDS2TJ333	33k	
R211	PFRGR25F1005	10M	S
R212	PFRGVR25J105	1M	
R213	PFRGVR25J105	1M	
R214	PFRGVR25J106	10M	S ⚠
		(SWITCH)	
SW101	PFSEDE2LCJ33	SWITCH	S ⚠
		(COILS)	
T101	ETB20DKA1	COIL	⚠
T201	ETB20DKD1	COIL	⚠

12.7. LOW VOLTAGE POWER SUPPLY BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB5	ETXKM450E5B	LOW VOLTAGE POWER BORD ASS'Y (RTL)	
		(ICs)	
IC101	PFVIFA5317P	IC	S
IC201	PFVIPQ05RD11	IC	S
		(TRANSISTORS)	
Q101	2SK2717	TRANSISTOR(SI)	
Q201	2SC1740S	TRANSISTOR(SI)	S
		(DIODES)	
D101	PFVDLT1505	DIODE(SI)	S ⚠
D102	PFVDLT1505	DIODE(SI)	S ⚠
D103	PFVDLT1505	DIODE(SI)	S ⚠
D104	PFVDLT1505	DIODE(SI)	S ⚠
D105	PFVD05NU42	DIODE(SI)	S
D106	PFVDERA9102	DIODE(SI)	S
D108	PFVDERA9102	DIODE(SI)	S
D109	PSVD10ELS4	DIODE(SI)	S
D110	PFVDERA9102	DIODE(SI)	S
D201	PFVDYG901C2R	DIODE(SI)	S
D202	PFVD21DQ06	DIODE(SI)	S
ZD101	MA4300	ZENER DIODE	
ZD102	MA4180	ZENER DIODE	
ZD201	MA4062N	ZENER DIODE	
		(CONNECTORS)	
CN101	PQJP2D98Z	CONNECTOR,2P	S
CN102	PQJP2D98Z	CONNECTOR,2P	S
CN201	PFJP08B01Z	CONNECTOR,8P	S
		(CAPACITORS)	
C101	ECQU2A224ML	0.22	
C102	ECQU2A224ML	0.22	
C103	PFCKDCS222MY	0.0022	S ⚠
C104	PFCKDCS222MY	0.0022	S ⚠
C105	PFCKDCD222MY	0.0022	S ⚠
C106	PFCKLH2W560H	56P	S ⚠
C107	ECQE6103	0.01	
C109	ECKN3A221KRP	220P	
C110	EEUFC1V390	39	
C111	ECQB1H102JF	0.001	
C112	ECQV1H224JZ	0.22	
C113	ECQB1H471JF	470p	
C115	ECQB1H103JF	0.01	
C116	ECQU2A104ML	0.1	⚠
C201	PFCKD2R102K	1000p	S
C202	EEUFC1V102	1000	
C204	EEUFC1C102	1000	
C206	EEUFC1A151	150	
C208	ECQV1H474JZ	0.47	
C212	ECQV1H474JZ	0.47	
		(COILS)	
L101	ELF15N010A	COIL	S ⚠
L102	ELF15N010A	COIL	S ⚠
L103	PQLQSTP03694	COIL	S ⚠
L105	PQLE53	COIL	S

Ref. No.	Part No.	Part Name & Description	Remarks
L202	PQLE53	COIL	S
		(PHOTO ELECTRIC TRANSDUCERS)	
PC101	0N3171S	PHOTO COUPLER	
PC102	PFVIS21ME6NY	PHOTO COUPLER	S ⚠
PC103	0N3171S	PHOTO COUPLER	
		(RESISTORS)	
R101	ERDS1TJ105	1M	
R102	ERG2SJ104	100k	
R103	ERG2SJ221	220	
R104	ERDS2TJ472	4.7k	
R105	ERX2SJR33	0.33	
R106	ERDS2TJ823	82k	
R107	ERDS2TJ823	82k	
R110	ER0S2TKF2000	200	
R111	ERDS2TJ150	15	
R112	ERDS2TJ181	180	
R113	ERDS2TJ220	22	
R114	ERDS2TJ682	6.8k	
R115	ER0S2TKF1502	15k	
R116	ER0S2TKF1000	100	
R117	ERDS2TJ123	12k	
R119	PFRDRF16J331	330	S
R120	ERDS2TJ470	47	
R121	ERG1SJ121	120	
R122	ER0S2TKF1202	12k	
R203	ERDS2TJ272	2.7k	
R204	ERDS2TJ102	1k	
R205	ERDS2TJ472	4.7k	
R206	ERDS2TJ562	5.6k	
R207	ERDS2TJ103	10k	
R208	ER0S2TKF6801	6.8k	
R209	ER0S2TKF1801	1.8k	
R212	ER0S2TKF3301	3.3k	
R213	ERDS2TJ221	220	
R214	ERDS2TJ102	1k	
R215	ERDS2TJ562	5.6k	
		(FUSES)	
F101	PFBA215315	FUSE	S ⚠
F102	PFBA215005	FUSE	S ⚠
		(TRANSFORMER)	
T101	ETB29AC1V8AD	TRANSFORMER	⚠
		(THERMISTOR)	
TH101	PFRTD207D8R0	THERMISTOR	S
		(VARISTOR)	
ZNR101	ERZVGAD751	VARISTOR	⚠
		(COMPONENTS PART)	
SCR101	PFXFTM1661SE	TRIAC	S ⚠

12.8. EXIT SENSOR BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB6	PFLP1481MZ-B	EXIT SENSOR BOARD ASS'Y (RTL)	
		(PHOTO ELECTRIC TRANSDUCER)	
PS51	PFVIRM574SL	PHOTO SENSOR	S
		(CONNECTORS)	
CN51	PQJP03A21Z	CONNECTOR,3P	S
CN52	PQJP5G43Y	CONNECTOR,5P	S
		(CAPACITOR)	
C52	ECUV1H271KBV	270p	

12.9. DRUM AND TONER SENSOR BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB7	PFLP1481MZ-C	DRUM & TONER SENSOR BORD ASS'Y (RTL)	
		(IC)	
IC60	B4ABC0000001	IC	
		(CONNECTOR)	
CN60	PQJP4G30Z	CONNECTOR,4P	S
		(SWITCH)	
SW60	PFSH1A005Z	SWITCH	S
		(CAPACITOR)	
C60	ECUV1C104ZFV	0.1	

12.10. VARISTOR BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB8	PFLP1481MZ-D	VARISTOR BOARD ASS'Y (RTL)	
		(VARISTOR)	
ZNR71	PFRV271NS05K	VARISTOR	

12.11. FIXTURES AND TOOLS

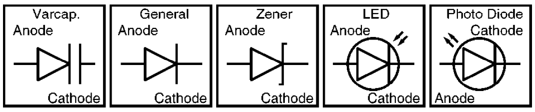
Ref. No.	Part No.	Part Name & Description	Remarks
EC1	PQZZ6K7Z	EXTENSION CORD, 6P	
EC2	PQZZ8K18Z	EXTENSION CORD, 8P	
EC3	PFZZ5K13Z	EXTENSION CORD, 5P	
EC4	PQZZ28F1Z	EXTENSION CORD, 28P	
EC5	PQZZ4K5Z	EXTENSION CORD, 4P	
EC6	PQZZ7K5Z	EXTENSION CORD, 7P	
EC7	PQZZ2K12Z	EXTENSION CORD, 2P	
EC8	PQZZ3K5Z	EXTENSION CORD, 3P	
EC9	PFZZFL501M	EXTENSION CORD, 5P	
EC10	PQZZ8K15Z	EXTENSION CORD, 8P	
	PFZZFL501M	TOOL FOR WRITING PROGRAM INTHE FLASH ROM.	
	KM79811245C0	BASIC FACSIMILE TECHNIQUE (for training service technicians)	

Note:
Tools and Extension Cords are useful for servicing.
(They make servicing easy.)

13. FOR THE SCHEMATIC DIAGRAMS

Note:

1. **DC voltage measurements are taken with an oscilloscope or a tester with a ground.**
2. **The schematic diagrams and circuit board may be modified at any time with the development of new technology.**
3.


Varcap.
Anode
Cathode
General
Anode
Cathode
Zener
Anode
Cathode
LED
Anode
Cathode
Photo Diode
Cathode
Anode

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

14. SCHEMATIC DIAGRAM

14.1. DIGITAL BOARD (PCB1)

15. SCHEMATIC DIAGRAM

15.1. ANALOG BOARD (PCB2)

15.2. OPERATION BOARD (PCB3)

15.3. HIGH VOLTAGE POWER SUPPLY BOARD (PCB4)

15.4. LOW VOLTAGE POWER SUPPLY BOARD (PCB5)

15.5. EXIT SENSOR BOARD (PCB6)

15.6. DRUM AND TONER SENSOR BOARD (PCB7)

15.7. VARISTOR BOARD (PCB8)

16. PRINTED CIRCUIT BOARD

16.1. DIGITAL BOARD (PCB1)

16.1.1. DIGITAL BOARD: COMPONENT VIEW

16.1.2. DIGITAL BOARD: BOTTOM VIEW

16.2. ANALOG BOARD (PCB2)

16.2.1. ANALOG BOARD: COMPONENT VIEW

16.2.2. ANALOG BOARD: BOTTOM VIEW

16.3. OPERATION BOARD (PCB3)

16.3.1. OPERATION BOARD:COMPONENT VIEW

16.3.2. OPERATION BOARD:BOTTOM VIEW

16.4. HIGH VOLTAGE POWER SUPPLY BOARD (PCB4)

16.4.1. HIGH VOLTAGE POWER SUPPLY BOARD:COMPONENT VIEW

16.4.2. HIGH VOLTAGE POWER SUPPLY BOARD:BOTTOM VIEW

16.5. LOW VOLTAGE POWER SUPPLY BOARD (PCB5)

16.5.1. LOW VOLTAGE POWER SUPPLY BOARD:COMPONENT VIEW

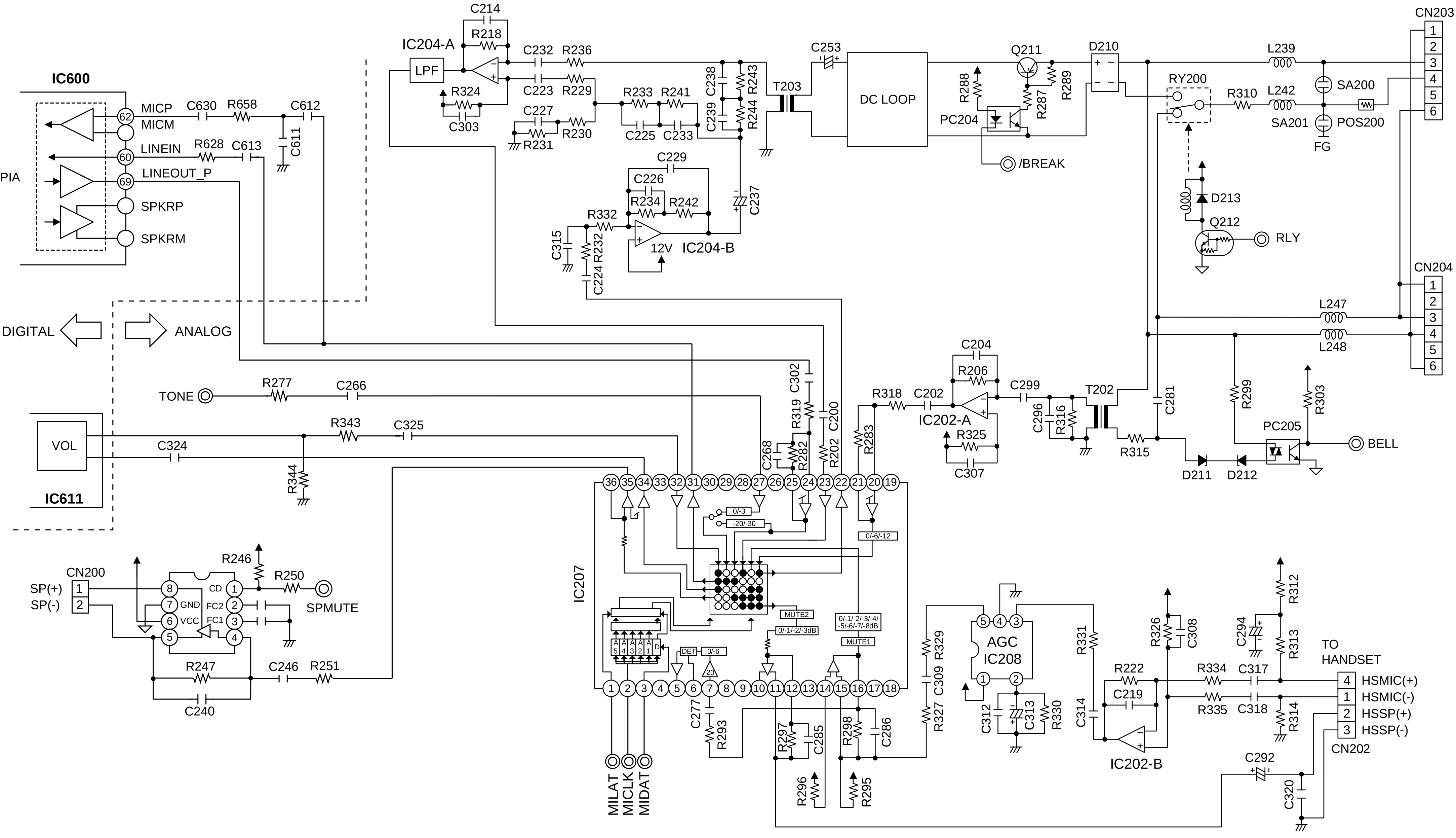
16.5.2. LOW VOLTAGE POWER SUPPLY BOARD:BOTTOM VIEW

16.6. EXIT SENSOR BOARD PARTS (PCB6)

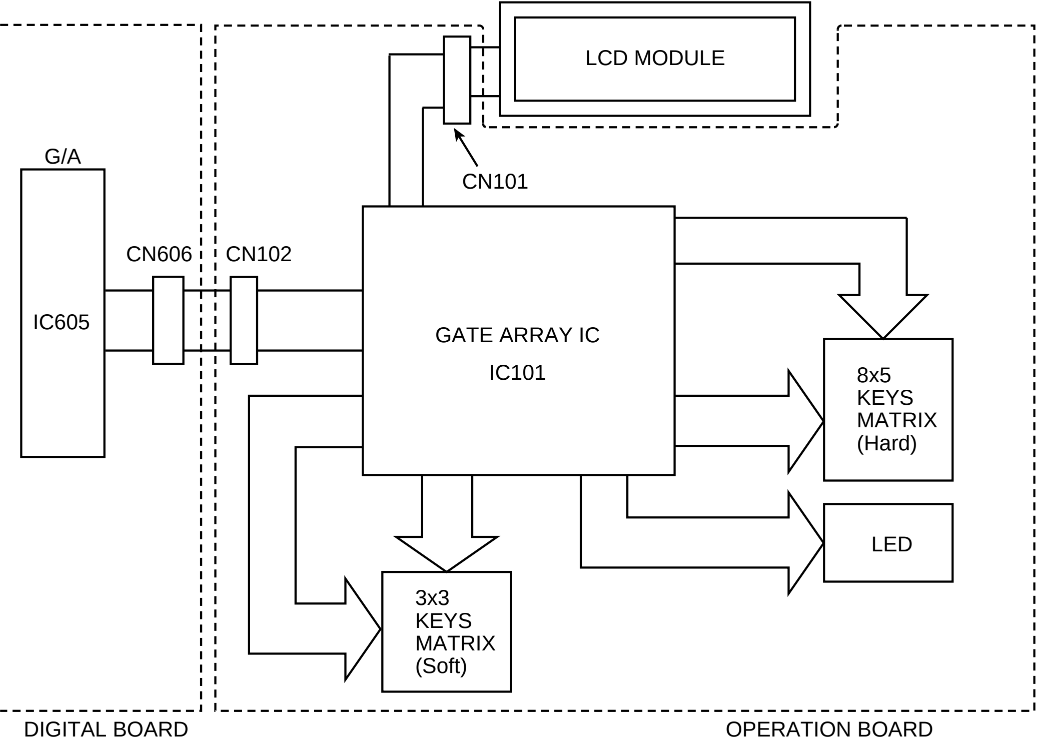
16.7. DRUM AND TONER SENSOR BOARD (PCB7)

16.8. VARISTOR BOARD (PCB8)

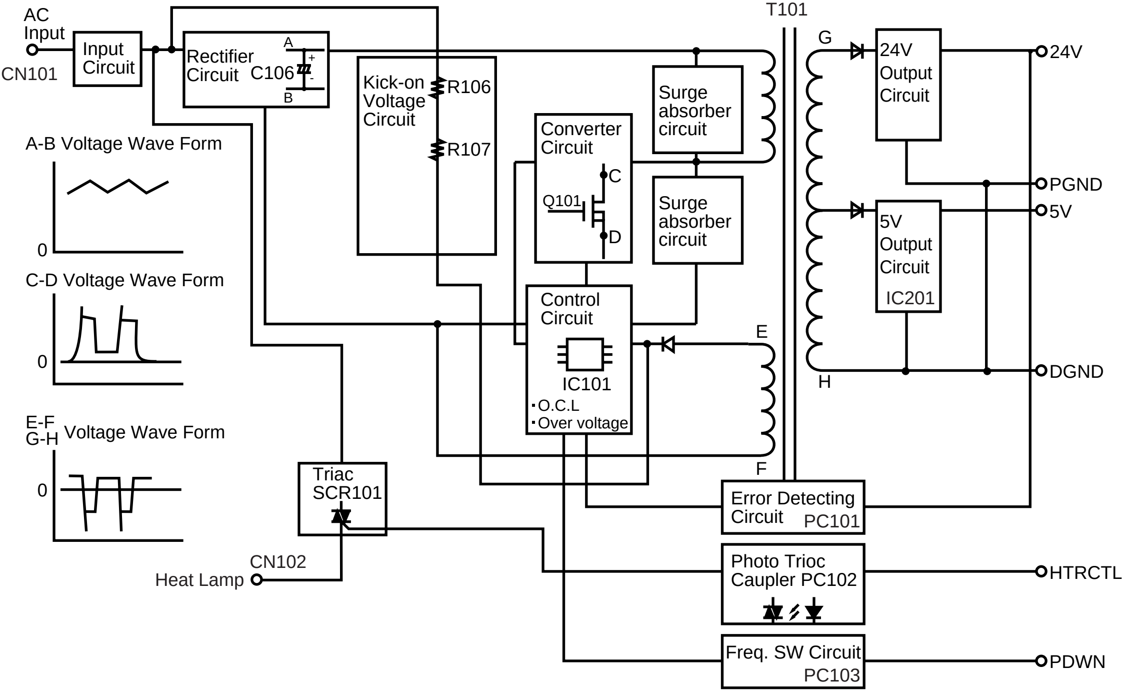
HI(Q) / KXFL512CX

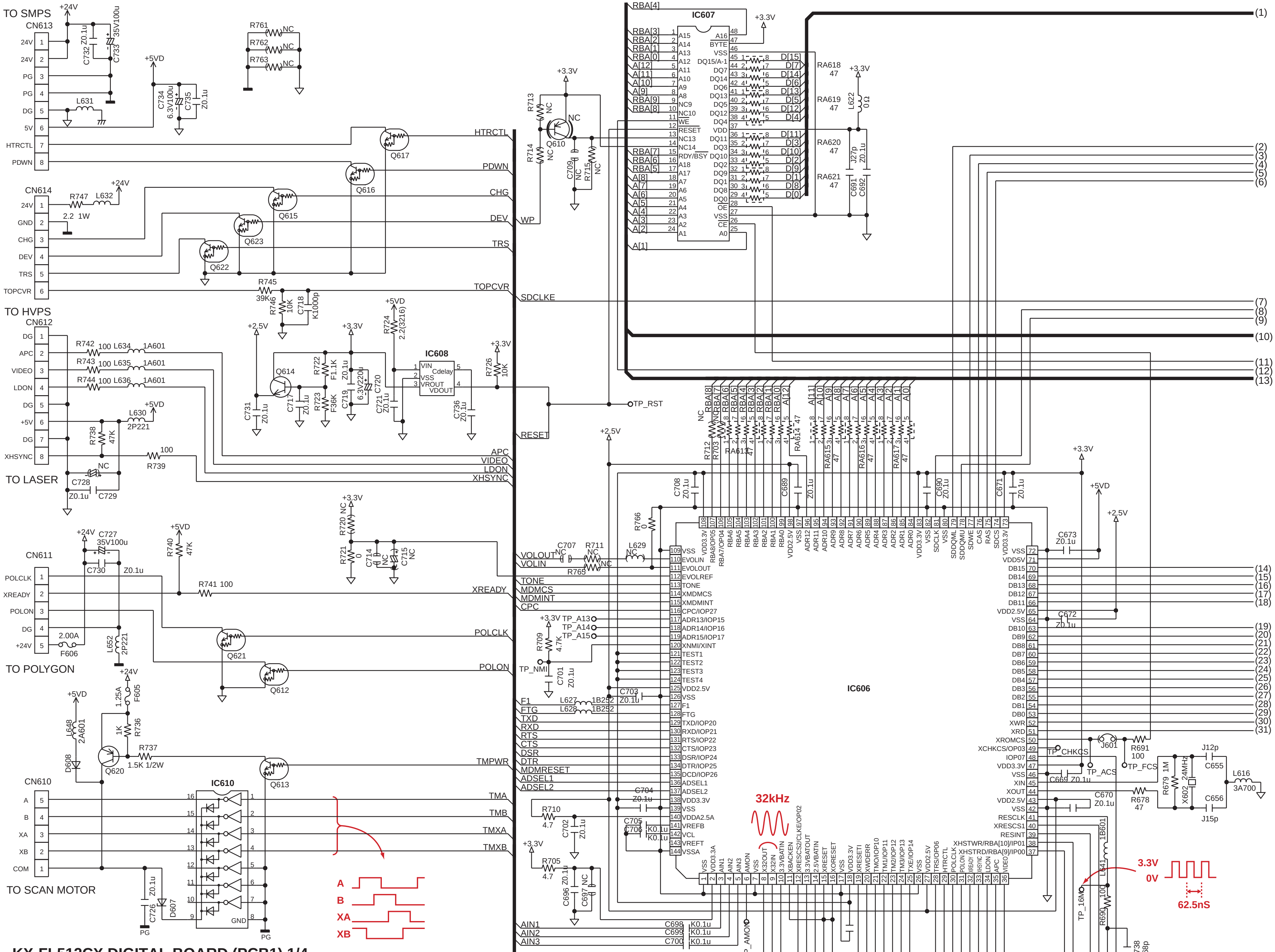

IC600
PIA
MICP
MICM
LINEIN
LINEOUT_P
SPKRP
SPKRM
62
60
69
C630
R658
C612
C611
R628
C613
DIGITAL
ANALOG
TONE
R277
C266
VOL
IC611
C324
R343
C325
R344
CN200
SP(+)
SP(-)
CD
GND
VCC
FC2
FC1
R246
R250
SPMUTE
R247
C240
C246
R251
IC204-A
LPF
C214
R218
R324
C303
C232
R236
C223
R229
C227
R230
R231
R233
R241
C225
C233
C238
C239
R243
R244
C229
C226
R234
R242
R332
C315
R232
C224
12V
IC204-B
C237
T203
C253
DC LOOP
Q211
R288
R287
R289
PC204
/BREAK
D210
RY200
R310
L242
L239
SA200
SA201
POS200
FG
D213
Q212
RLY
CN203
CN204
L247
L248
C302
R319
C200
R202
C268
R282
R283
R318
C202
C204
R206
IC202-A
R325
C307
C299
C296
R316
T202
R315
C281
R299
R303
PC205
D211
D212
BELL
IC207
0/-3
-20/-30
0/-6/-12
MUTE2
0/-1/-2/-3dB
0/-1/-2/-3/-4/-5/-6/-7/-8dB
MUTE1
DET
0/-6
20
MILAT
MICLK
MIDAT
C277
R293
R297
C285
R296
R298
C286
R295
R329
C309
R327
AGC
IC208
C312
C313
R330
R331
C314
R222
C219
IC202-B
R326
C308
R334
R335
C317
C318
C294
R312
R313
R314
TO HANDSET
HSMIC(+)
HSMIC(-)
HSSP(+)
HSSP(-)
CN202
C292
C320

KX-FL512CX : ANALOG BOARD : BLOCK DIAGRAM


LCD MODULE
G/A
CN101
IC605
CN606
CN102
GATE ARRAY IC
IC101
8x5
KEYS
MATRIX
(Hard)
LED
3x3
KEYS
MATRIX
(Soft)
DIGITAL BOARD
OPERATION BOARD

Block Diagram


AC
Input
CN101
Input
Circuit
Rectifier
Circuit
C106
A
B
+
-
Kick-on
Voltage
Circuit
R106
R107
T101
Surge
absorber
circuit
Converter
Circuit
C
Q101
D
Surge
absorber
circuit
G
24V
Output
Circuit
24V
PGND
5V
Output
Circuit
IC201
5V
DGND
H
A-B Voltage Wave Form
0
C-D Voltage Wave Form
0
E-F
G-H
Voltage Wave Form
0
Control
Circuit
IC101
·O.C.L
·Over voltage
E
F
Triac
SCR101
CN102
Heat Lamp
Error Detecting
Circuit
PC101
Photo Trioc
Caupler PC102
HTRCTL
Freq. SW Circuit
PC103
PDWN



TO SMPS
CN613
24V
24V
PG
PG
DG
5V
HTRCTL
PDWN
+24V
C732 Z0.1u
C733 35V100u
L631
+5VD
C734 6.3V100u
C735 Z0.1u
R761 NC
R762 NC
R763 NC
CN614
R747 2.2 1W
L632
CHG
DEV
TRS
TOPCVR
Q617
Q616
Q615
Q623
Q622
R745 39K
R746 10K
C718 K1000p
TO HVPS
CN612
APC
VIDEO
LDON
+5V
XHSYNC
R742 100 L634 1A601
R743 100 L635 1A601
R744 100 L636 1A601
L630 2P221
R738 47K
R739 100
C728 Z0.1u
C729
NC
TO LASER
+3.3V
R713 NC
R714 NC
Q610
NC
C709 NC
R715 NC
WP
SDCLKE
IC607
RA618 47
RA619 47
RA620 47
RA621 47
L622 0Ω
J27p
C691 C692 Z0.1u
IC608
VIN
Cdelay
VSS
VROUT
VDOUT
R724 2.2(3216)
R726 10K
C736 Z0.1u
+2.5V
Q614
C731 Z0.1u
C717 Z0.1u
R722 F1.1K
R723 F36K
C719 Z0.1u
C720 6.3V220u
C721 Z0.1u
RESET
TP_RST
CN611
POLCLK
XREADY
POLON
C727 35V100u
C730 Z0.1u
R740 47K
R741 100
F606 2.00A
L652 2P221
Q621
Q612
TO POLYGON
R720 NC
R721 0
C714 NC
C715 NC
VOLOUT
VOLIN
C707 NC
R711 NC
R765 NC
L629 NC
R766 0
TONE
MDMCS
MDMINT
CPC
TP_A13
TP_A14
TP_A15
R709 4.7K
TP_NMI
C701 Z0.1u
F1
FTG
TXD
RXD
RTS
CTS
DSR
DTR
MDMRESET
ADSEL1
ADSEL2
L627 1B252
L628 1B252
C703 Z0.1u
IC606
CN610
F605 1.25A
L648 2A601
R736 1K
D608
Q620
R737 1.5K 1/2W
Q613
TMPWR
IC610
TMA
TMB
TMXA
TMXB
A
B
XA
XB
COM
TO SCAN MOTOR
C726 Z0.1u
D607
GND
C704 Z0.1u
R710 4.7
C702 Z0.1u
C705
C706
K0.1u
R705 4.7
C696 Z0.1u
C697 NC
AIN1
AIN2
AIN3
C698 K0.1u
C699 K0.1u
C700 K0.1u
TP_AMON
32kHz
3.3V
0V
62.5nS
TP_CHKCS
TP_ACS
TP_FCS
J601
R691 100
C669 Z0.1u
C670 Z0.1u
R678 47
R679 1M
X602 24MHz
J12p
C655
C656
J15p
L616 3A700
L641 1B601
R690 100
TP_16M
C738 J68p
C708 Z0.1u
C689 Z0.1u
C690 Z0.1u
C671 Z0.1u
C673 Z0.1u
C672 Z0.1u
RA612 47
RA614 47
RA615 47
RA616 47
RA617 47
R712 NC
R703 NC
(1)
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(7)
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(11)
(12)
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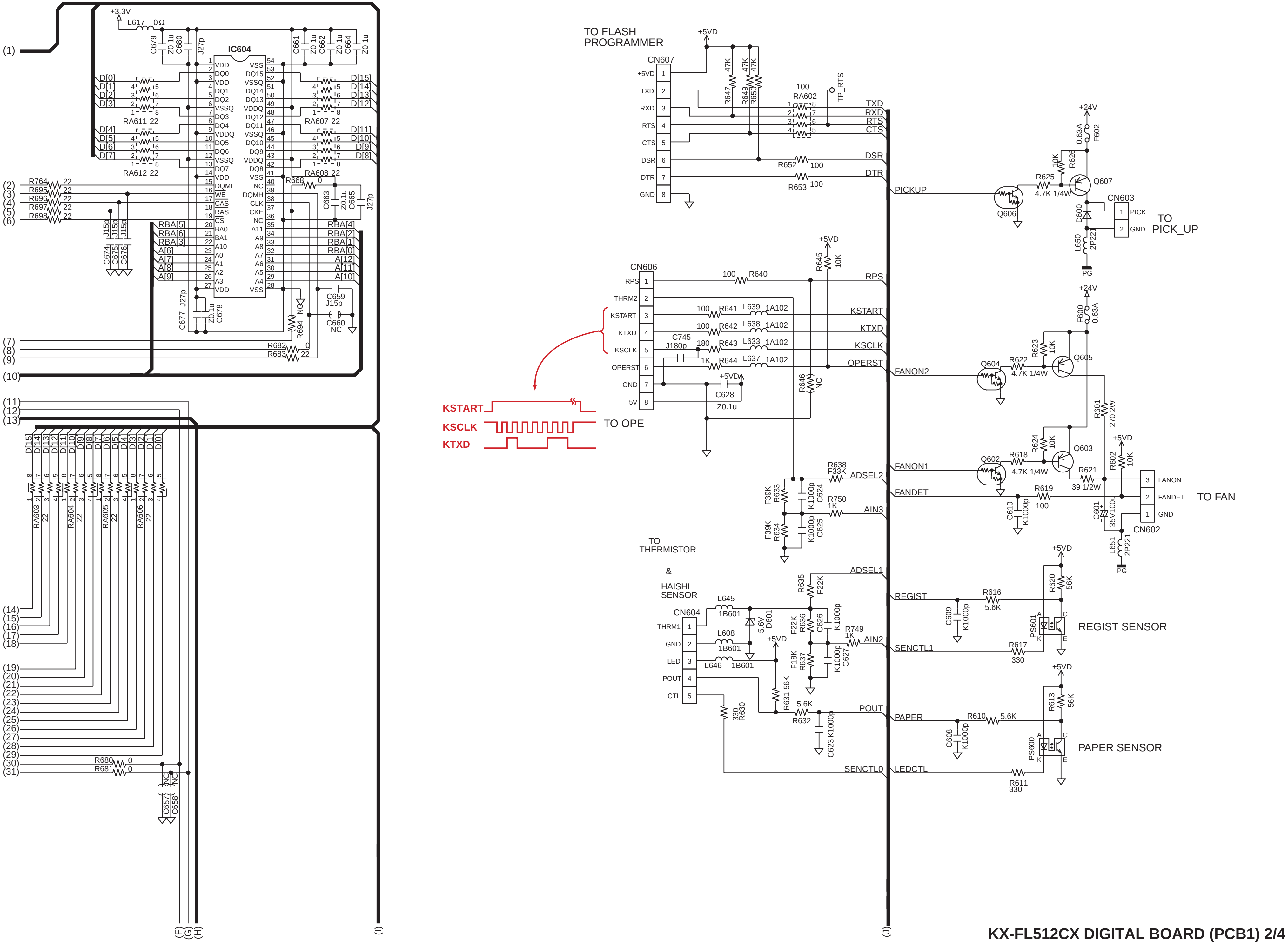
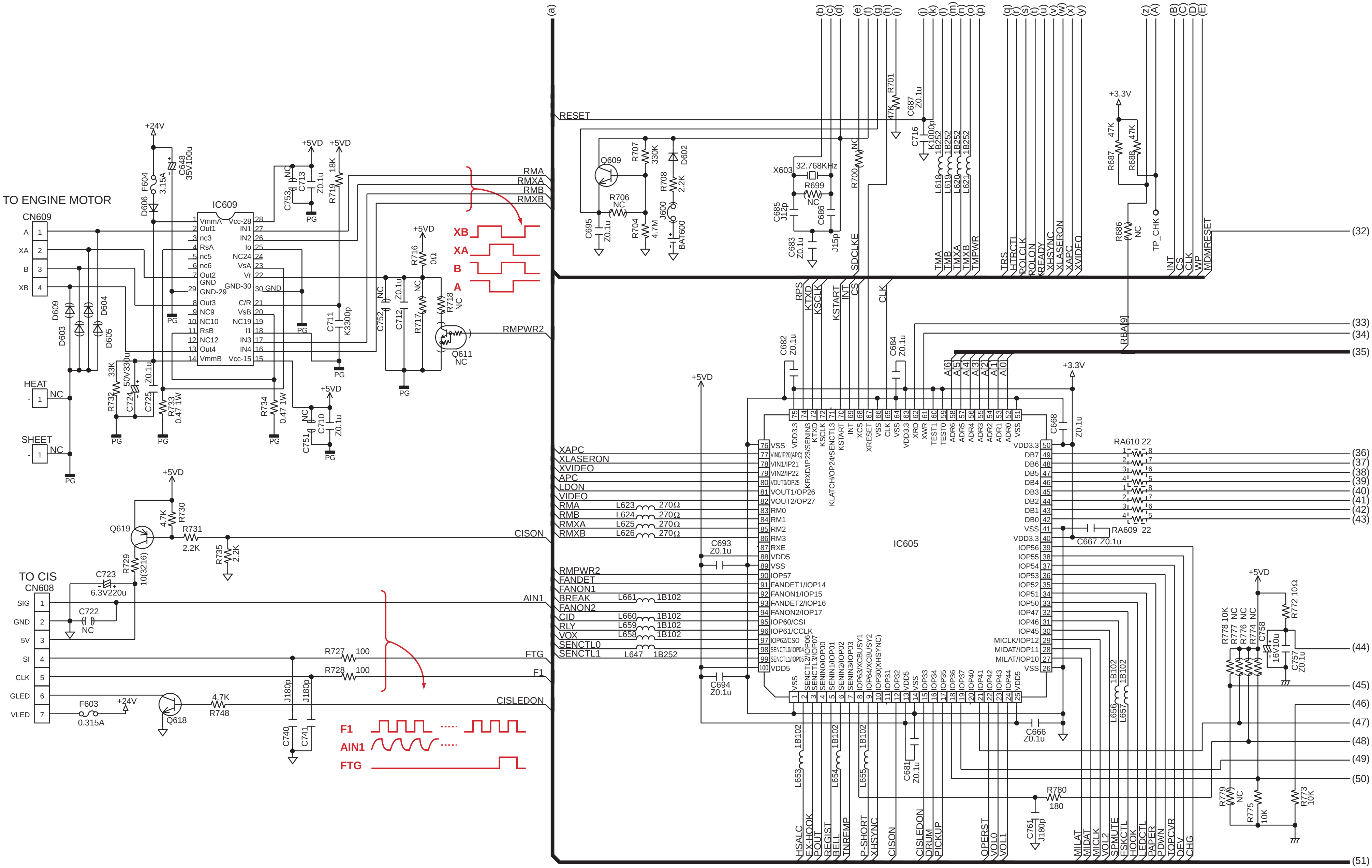
(v)
(w)
(x)
(y)
(z)
(A)
(B)
(C)
(D)
(E)

KX-FL512CX DIGITAL BOARD (PCB1) 1/4



+3.3V
L617 0Ω
C679 Z0.1u C680 J27p
IC604
VDD DQ0 VDD DQ1 DQ2 VSSQ DQ3 DQ4 VDDQ DQ5 DQ6 VSSQ DQ7 VDD DQML WE CAS RAS CS BA0 BA1 A10 A0 A1 A2 A3 VDD
VSS DQ15 VSSQ DQ14 DQ13 VDDQ DQ12 DQ11 VSSQ DQ10 DQ9 VDDQ DQ8 VSS NC DQMH CLK CKE NC A11 A9 A8 A7 A6 A5 A4 VSS
C661 Z0.1u C662 Z0.1u C664 Z0.1u
D[0] D[1] D[2] D[3] D[4] D[5] D[6] D[7]
D[15] D[14] D[13] D[12] D[11] D[10] D[9] D[8]
RA611 22
RA612 22
RA607 22
RA608 22
R764 22
R695 22
R696 22
R697 22
R698 22
J15p J15p J15p
C674 C675 C676
RBA[5] RBA[6] RBA[3] A[6] A[7] A[8] A[9]
RBA[4] RBA[2] RBA[1] RBA[0] A[12] A[11] A[10]
R668 0
C663 Z0.1u C665 J27p
C677 J27p Z0.1u C678
R694 NC
C659 J15p
C660 NC
R682 0
R683 22
(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13)
D[15] D[14] D[13] D[12] D[11] D[10] D[9] D[8] D[7] D[6] D[5] D[4] D[3] D[2] D[1] D[0]
RA603 22
RA604 22
RA605 22
RA606 22
(14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31)
R680 0
R681 0
C657 NC C658 NC
(F) (G) (H) (I) (J)
TO FLASH PROGRAMMER
+5VD
CN607
+5VD TXD RXD RTS CTS DSR DTR GND
R647 47K R649 47K R650 47K
100 RA602
TP_RTS
TXD RXD RTS CTS DSR DTR
R652 100
R653 100
PICKUP
Q606
R625 4.7K 1/4W
10K R626
Q607
+24V
0.63A F602
D600
CN603
PICK GND
TO PICK_UP
L650 2P221
PG
CN606
RPS THRM2 KSTART KTXD KSCLK OPERST GND 5V
100 R640
+5VD
R645 10K
R641 100 L639 1A102
R642 100 L638 1A102
C745 J180p
R643 180 L633 1A102
R644 1K L637 1A102
+5VD C628 Z0.1u
R646 NC
RPS KSTART KTXD KSCLK OPERST
KSTART
KSCLK
KTXD
TO OPE
+24V
F600 0.63A
R623 10K
Q605
Q604
R622 4.7K 1/4W
FANON2
R601 270 2W
R624 10K
Q603
Q602
R618 4.7K 1/4W
FANON1
R621 39 1/2W
+5VD
R602 10K
CN602
FANON FANDET GND
TO FAN
FANDET
R619 100
C610 K1000p
C601 35V100u
L651 2P221
PG
R638 F33K
ADSEL2
R633 F39K
C624 K1000p
R750 1K
AIN3
R634 F39K
C625 K1000p
TO THERMISTOR & HAISHI SENSOR
CN604
THRM1 GND LED POUT CTL
L645 1B601
D601 5.6V
L608 1B601
L646 1B601
+5VD
R635 F22K
ADSEL1
R636 F22K
C626 K1000p
R749 1K
AIN2
R637 F18K
C627 K1000p
R631 56K
5.6K R632
POUT
C623 K1000p
330 R630
SENCTL0
REGIST
C609 K1000p
R616 5.6K
+5VD
R620 56K
PS601
REGIST SENSOR
SENCTL1
R617 330
PAPER
C608 K1000p
R610 5.6K
+5VD
R613 56K
PS600
PAPER SENSOR
LEDCTL
R611 330

KX-FL512CX DIGITAL BOARD (PCB1) 2/4


TO ENGINE MOTOR
CN609
A
XA
B
XB
HEAT
SHEET
NC
IC609
F604 3.15A
D606
C648 35V100u
+24V
+5VD
C753 NC
C713 Z0.1u
R719 18K
C711 K3300p
C752 NC
C712 Z0.1u
R717 NC
R716 0Ω
R718 NC
Q611 NC
RMA
RMXA
RMB
RMXB
RMPWR2
XB
XA
B
A
D609
D603
D604
D605
R732 33K
C724 50V330u
C725 Z0.1u
R733 0.47 1W
R734 0.47 1W
C751 NC
C710 Z0.1u
PG
Q619
R730 4.7K
R731 2.2K
R735 2.2K
R729 10(3216)
CISON
TO CIS
CN608
SIG
GND
5V
SI
CLK
GLED
VLED
C723 6.3V220u
C722 NC
F603 0.315A
Q618
R748 4.7K
R727 100
R728 100
C740 J180p
C741 J180p
AIN1
FTG
F1
CISLEDON
RESET
Q609
R707 330K
D602
R706 NC
R708 2.2K
J600
R704 4.7M
BAT600
C695 Z0.1u
X603 32.768KHz
R699 NC
C685 J12p
C686 J15p
C683 Z0.1u
R700 NC
R701 47K
C687 Z0.1u
C716 K1000p
L618 1B252
L619 1B252
L620 1B252
L621 1B252
R687 47K
R688 47K
+3.3V
R686 NC
TP_CHK
SDCLKE
TMA
TMB
TMXA
TMXB
TMPWR
TRS
HTRCTL
POLCLK
POLON
READY
XHSYNC
XLASERON
XAPC
XVIDEO
INT
CS
CLK
WP
MDMRESET
RPS
KTXD
KSCLK
KSTART
C682 Z0.1u
C684 Z0.1u
REA[9]
A[6]
A[5]
A[4]
A[3]
A[2]
A[1]
A[0]
C668 Z0.1u
IC605
RA610 22
RA609 22
C667 Z0.1u
C693 Z0.1u
C694 Z0.1u
XAPC
XLASERON
XVIDEO
APC
LDON
VIDEO
L623 270Ω
L624 270Ω
L625 270Ω
L626 270Ω
FANDET
FANON1
BREAK
FANON2
CID
RLY
VOX
SENCTL0
SENCTL1
L661 1B102
L660 1B102
L659 1B102
L658 1B102
L647 1B252
L653 1B102
L654 1B102
L655 1B102
L656 1B102
L657 1B102
C681 Z0.1u
C666 Z0.1u
R780 180
C761 J180p
R778 10K
R777 NC
R776 NC
R774 NC
C758 16V10u
C757 Z0.1u
R772 10Ω
R779 NC
R775 10K
R773 10K
HSALC
EX-HOOK
POUT
REGIST
BELL
TNREMP
P-SHORT
XHSYNC
CISON
CISLEDON
DRUM
PICKUP
OPERST
VOL0
VOL1
MILAT
MIDAT
MICLK
VOL2
SPMUTE
ESKCTL
HOOK
LEDCTL
PAPER
PDWN
TOPCVR
DEV
CHG
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(b)
(c)
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(f)
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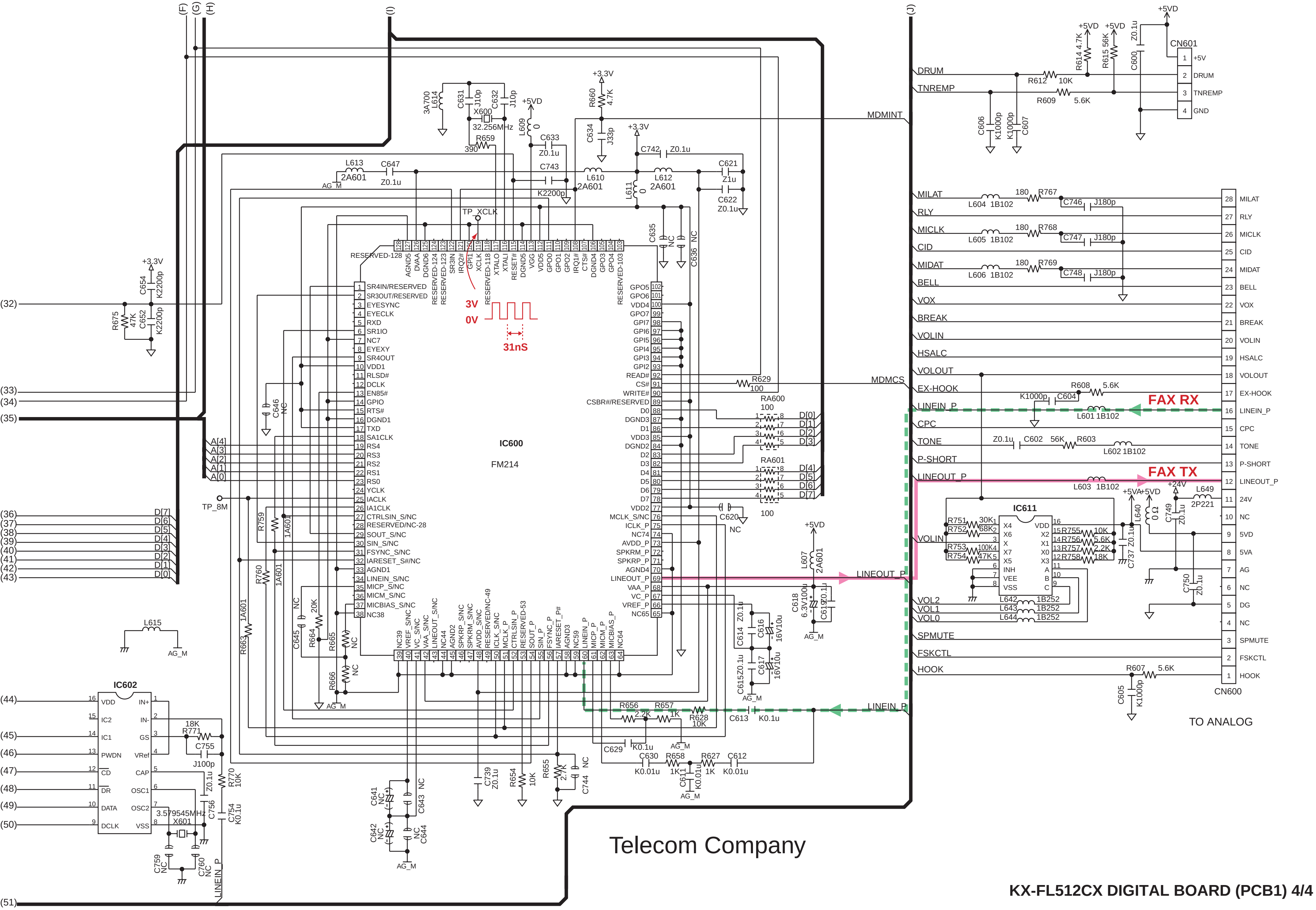
KX-FL512CX DIGITAL BOARD (PCB1) 3/4


(F)
(G)
(H)
(I)
(J)
IC600
FM214
IC611
IC602
CN600
CN601
TO ANALOG
FAX RX
FAX TX
TP_XCLK
TP_8M
3V
0V
31nS
X600
32.256MHz
X601
3.579545MHz
+3.3V
+5VD
+5V
+24V
+5VA
AG_M
RA600
RA601
MDMINT
MDMCS
LINEOUT_P
LINEIN_P
DRUM
TNREMP
GND
MILAT
RLY
MICLK
CID
MIDAT
BELL
VOX
BREAK
VOLIN
HSALC
VOLOUT
EX-HOOK
CPC
TONE
P-SHORT
24V
NC
5VD
5VA
AG
DG
SPMUTE
FSKCTL
HOOK
VOL2
VOL1
VOL0
A[4]
A[3]
A[2]
A[1]
A[0]
D[7]
D[6]
D[5]
D[4]
D[3]
D[2]
D[1]
D[0]
(32)
(33)
(34)
(35)
(36)
(37)
(38)
(39)
(40)
(41)
(42)
(43)
(44)
(45)
(46)
(47)
(48)
(49)
(50)
(51)
1 SR4IN/RESERVED
2 SR3OUT/RESERVED
3 EYESYNC
4 EYECLK
5 RXD
6 SR1IO
7 NC7
8 EYEXY
9 SR4OUT
10 VDD1
11 RLSD#
12 DCLK
13 EN85#
14 GPIO
15 RTS#
16 DGND1
17 TXD
18 SA1CLK
19 RS4
20 RS3
21 RS2
22 RS1
23 RS0
24 YCLK
25 IACLK
26 IA1CLK
27 CTRLSIN_S/NC
28 RESERVED/NC-28
29 SOUT_S/NC
30 SIN_S/NC
31 FSYNC_S/NC
32 IARESET_S#/NC
33 AGND1
34 LINEIN_S/NC
35 MICP_S/NC
36 MICM_S/NC
37 MICBIAS_S/NC
38 NC38
RESERVED-128
GPO5 102
GPO6 101
VDD4 100
GPO7 99
GPI7 98
GPI6 97
GPI5 96
GPI4 95
GPI3 94
GPI2 93
READ# 92
CS# 91
WRITE# 90
CSBR#/RESERVED 89
D0 88
DGND3 87
D1 86
VDD3 85
DGND2 84
D2 83
D3 82
D4 81
D5 80
D6 79
D7 78
VDD2 77
MCLK_S/NC 76
ICLK_P 75
NC74 74
AVDD_P 73
SPKRM_P 72
SPKRP_P 71
AGND4 70
LINEOUT_P 69
VAA_P 68
VC_P 67
VREF_P 66
NC65 65
VDD IN+ IC2 IN- IC1 GS PWDN VRef CD CAP DR OSC1 DATA OSC2 DCLK VSS
X4 X6 X X7 X5 INH VEE VSS VDD X2 X1 X0 X3 A B C
R612 10K
R609 5.6K
R614 4.7K
R615 56K
R767 180
R768 180
R769 180
R608 5.6K
R603 56K
R607 5.6K
R629 100
R656 2.2K
R657 1K
R628 10K
R658 1K
R627 1K
R659 390
R660 4.7K
R675 47K
R771 18K
R770 10K
L601 1B102
L602 1B102
L603 1B102
L604 1B102
L605 1B102
L606 1B102
L607 2A601
L609 0
L610 2A601
L611 0
L612 2A601
L613 2A601
L614 3A700
L615
L640 0 Ω
L642 1B252
L643 1B252
L644 1B252
L649 2P221

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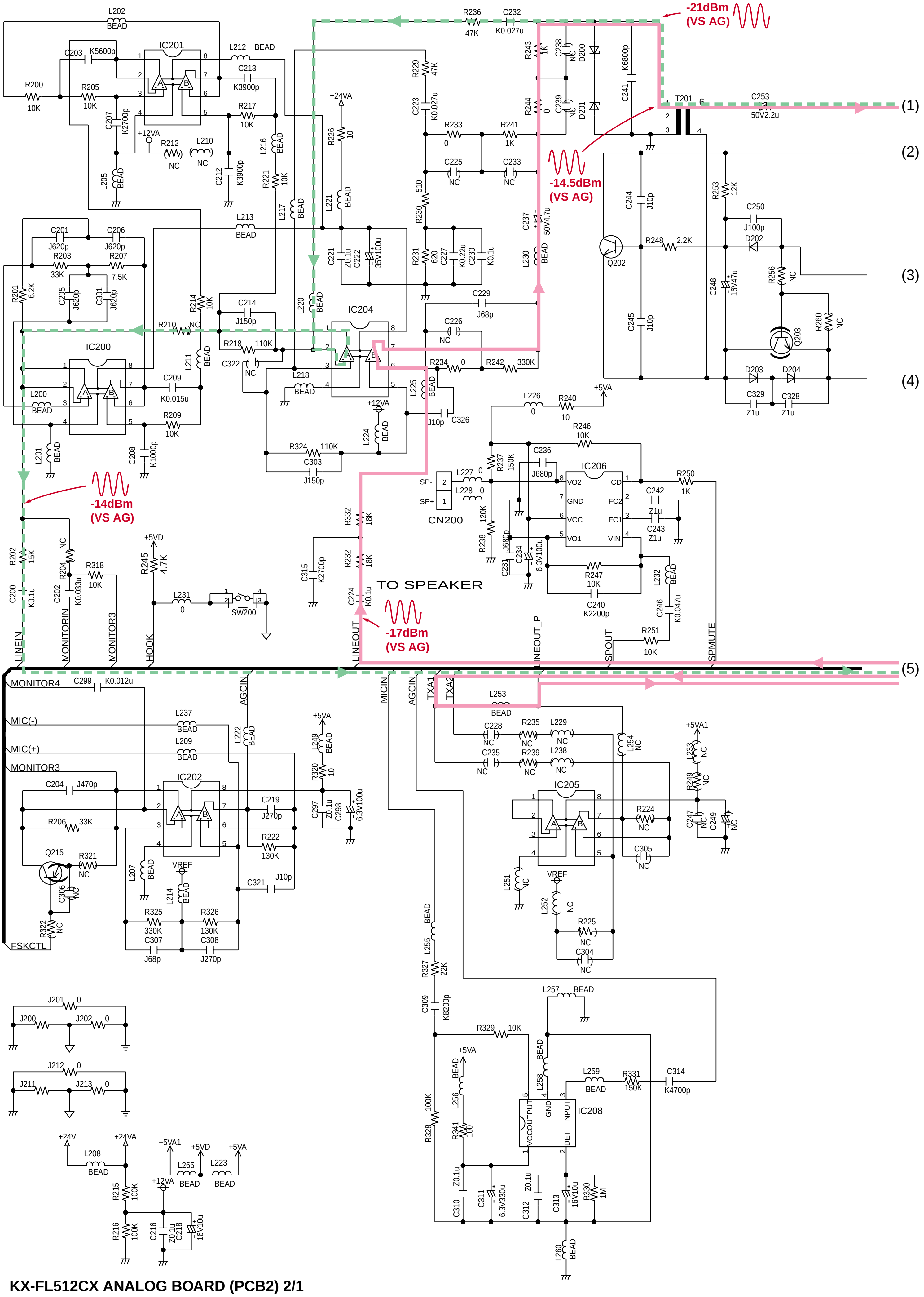
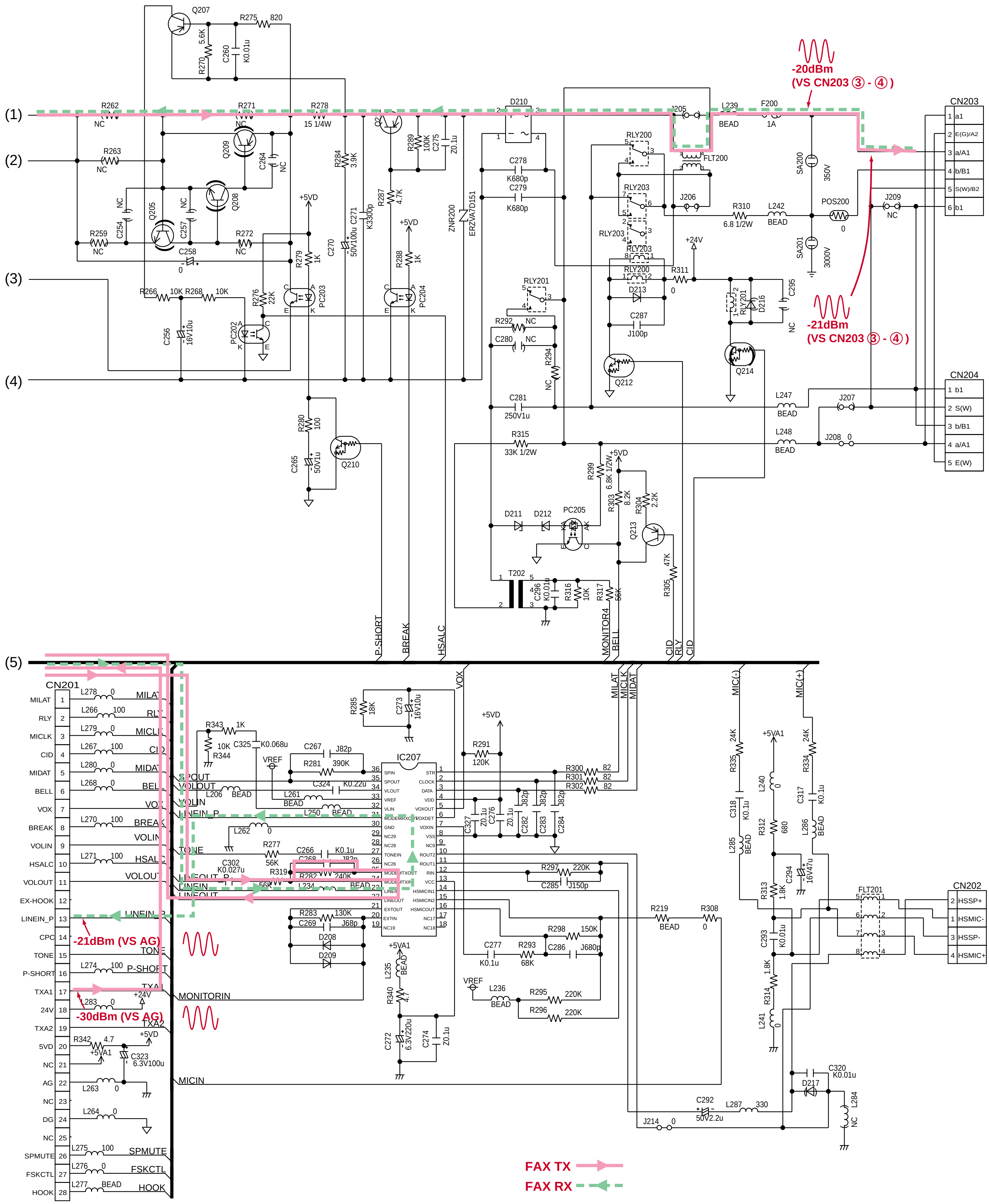
KX-FL512CX DIGITAL BOARD (PCB1) 4/4


-21dBm
(VS AG)
-14.5dBm
(VS AG)
-14dBm
(VS AG)
-17dBm
(VS AG)
(1)
(2)
(3)
(4)
(5)
L202
BEAD
C203
K5600p
IC201
R200
10K
R205
10K
C207
K2700p
+12VA
R212
NC
L210
NC
C212
K3900p
L205
BEAD
L212
BEAD
C213
K3900p
R217
10K
L216
BEAD
R221
10K
L217
BEAD
R226
10
+24VA
L221
BEAD
R236
47K
C232
K0.027u
R229
47K
C223
K0.027u
R233
0
R241
1K
C225
NC
C233
NC
R230
510
R231
620
C227
K0.22u
C230
K0.1u
R243
1K
C238
NC
D200
R244
0
C239
NC
D201
C241
K6800p
C237
50V4.7u
L230
BEAD
T201
C253
50V2.2u
C244
J10p
C245
J10p
Q202
R248
2.2K
R253
12K
C250
J100p
D202
C248
16V47u
R256
NC
R260
NC
Q203
D203
D204
C329
Z1u
C328
Z1u
C201
J620p
C206
J620p
R203
33K
R207
7.5K
R201
6.2K
C205
J620p
C301
J620p
R214
10K
R210
NC
L213
BEAD
C214
J150p
IC200
C209
K0.015u
R209
10K
L211
BEAD
L200
BEAD
L201
BEAD
C208
K1000p
R218
110K
C322
NC
L218
BEAD
L220
BEAD
C221
Z0.1u
C222
35V100u
IC204
+12VA
L224
BEAD
R324
110K
C303
J150p
C229
J68p
C226
NC
R234
0
R242
330K
L225
BEAD
J10p
C326
L226
0
R240
10
+5VA
R246
10K
R237
150K
C236
J680p
IC206
R250
1K
C242
Z1u
C243
Z1u
L227
0
L228
0
SP-
SP+
CN200
VO2
GND
VCC
VO1
CD
FC2
FC1
VIN
R238
120K
C231
J680p
C234
6.3V100u
R247
10K
C240
K2200p
L232
BEAD
C246
K0.047u
R251
10K
TO SPEAKER
R332
18K
R232
18K
C315
K2700p
C224
K0.1u
R202
15K
C200
K0.1u
R204
NC
C202
K0.033u
R318
10K
+5VD
R245
4.7K
L231
0
SW200
LINEIN
MONITORIN
MONITOR3
HOOK
LINEOUT
LINEOUT_P
SPOUT
SPMUTE
MONITOR4
C299
K0.012u
MIC(-)
MIC(+)
MONITOR3
AGCIN
MICIN
AGCIN
TXA1
TXA2
L237
BEAD
L209
BEAD
L222
BEAD
+5VA
L249
BEAD
R320
10
C297
Z0.1u
C298
6.3V100u
IC202
C204
J470p
R206
33K
C219
J270p
R222
130K
C321
J10p
Q215
R321
NC
C306
NC
R322
NC
FSKCTL
L207
BEAD
VREF
L214
BEAD
R325
330K
C307
J68p
R326
130K
C308
J270p
L253
BEAD
C228
NC
R235
NC
L229
NC
C235
NC
R239
NC
L238
NC
L254
NC
+5VA1
L233
NC
R249
NC
IC205
R224
NC
C247
NC
C249
NC
C305
NC
L251
NC
VREF
L252
NC
R225
NC
C304
NC
L255
BEAD
R327
22K
C309
K8200p
R329
10K
L257
BEAD
+5VA
L256
BEAD
L258
BEAD
L259
BEAD
R331
150K
C314
K4700p
IC208
VCC
OUTPUT
GND
INPUT
DET
R328
100K
R341
100
C310
Z0.1u
C311
6.3V330u
C312
Z0.1u
C313
16V10u
R330
1M
L260
BEAD
J201
0
J200
J202
0
J212
0
J211
J213
0
+24V
+24VA
L208
BEAD
R215
100K
R216
100K
+12VA
C216
Z0.1u
C218
16V10u
+5VA1
+5VD
+5VA
L265
BEAD
L223
BEAD

KX-FL512CX ANALOG BOARD (PCB2) 2/1


(1)
(2)
(3)
(4)
(5)
Q207
R275 820
R270 5.6K
C260 K0.01u
R262 NC
R271 NC
R278 15 1/4W
R263 NC
Q209
C264 NC
Q208
Q205
C254 NC
C257 NC
R259 NC
C258 0
R272 NC
R284 3.9K
C271 50V100u K3300p
R287 4.7K
R289 100K
C275 Z0.1u
+5VD
R279 1K
R288 1K
PC203
PC204
R266 10K
R268 10K
R276 22K
C256 16V10u
PC202
C270
ZNR200 ERZVA7D151
D210
C278 K680p
C279 K680p
RLY200
RLY203
RLY201
J205
L239 BEAD
F200 1A
FLT200
J206
R310 6.8 1/2W
L242 BEAD
POS200 0
J209 NC
SA200 350V
SA201 3000V
+24V
R311 0
D213
C287 J100p
D216
C295 NC
Q212
Q214
R292 NC
C280 NC
R294 NC
C281 250V1u
R315 33K 1/2W
L247 BEAD
J207
L248 BEAD
J208 0
CN203
1 a1
2 E(G)/A2
3 a/A1
4 b/B1
5 S(W)/B2
6 b1
CN204
1 b1
2 S(W)
3 b/B1
4 a/A1
5 E(W)
R280 100
C265 50V1u
Q210
R299 6.8K 1/2W
+5VD
R303 8.2K
R304 2.2K
Q213
D211
D212
PC205
R305 47K
T202
C296 K0.01u
R316 10K
R317 56K
P-SHORT
BREAK
HSALC
MONITOR4
BELL
CID
RLY
CID
VOX
MILAT
MICLK
MIDAT
MIC(-)
MIC(+)
CN201
1 MILAT
2 RLY
3 MICLK
4 CID
5 MIDAT
6 BELL
7 VOX
8 BREAK
9 VOLIN
10 HSALC
11 VOLOUT
12 EX-HOOK
13 LINEIN_P
14 CPC
15 TONE
16 P-SHORT
17 TXA1
18 24V
19 TXA2
20 5VD
21 NC
22 AG
23 NC
24 DG
25 NC
26 SPMUTE
27 FSKCTL
28 HOOK
L278 0
L266 100
L279 0
L267 100
L280 0
L268 0
L270 100
L271 100
L274 100
L283 0
R342 4.7
+5VA1
C323 6.3V100u
L263 0
L264 0
L275 100
L276 0
L277 BEAD
SPOUT
VOLOUT
VOLIN
LINEIN_P
TONE
LINEOUT_P
LINEIN
LINEOUT
MONITORIN
MICIN
SPMUTE
FSKCTL
HOOK
R285 18K
C273 16V10u
R343 1K
R344 10K
C325 K0.068u
C267 J82p
R281 390K
VREF
C324 K0.22u
L206 BEAD
L261 BEAD
L250 BEAD
L262 0
R277 56K
C266 K0.1u
C268 J82p
C302 K0.027u
R319 56K
R282 240K
L234 BEAD
R283 130K
C269 J68p
D208
D209
IC207
SPIN
SPOUT
VLOUT
VREF
VLIN
MODEMRXO
GND
NC29
NC28
TONEIN
NC26
MODEMTXOUT
MODEMTXIN
LINEIN
LINEOUT
EXTOUT
EXTIN
NC19
STR
CLOCK
DATA
VDD
VOXOUT
VOXDET
VOXIN
VSS
NC9
ROUT2
ROUT1
RIN
VCC
HSMICIN1
HSMICIN2
HSMICOUT
NC17
NC18
R291 120K
R300 82
R301 82
R302 82
C327 Z0.1u
C276 Z0.1u
C282 J82p
C283 J82p
C284 J82p
R297 220K
C285 J150p
R298 150K
C277 K0.1u
R293 68K
C286 J680p
R219 BEAD
R308 0
+5VA1
L235 BEAD
R340 4.7
C272 6.3V220u
C274 Z0.1u
L236 BEAD
R295 220K
R296 220K
R335 24K
C318 K0.1u
L285 BEAD
+5VA1
L240 0
R312 680
R313 1.8K
C294 16V47u
C293 K0.01u
R314 1.8K
L241 0
R334 24K
C317 K0.1u
L286 BEAD
FLT201
CN202
2 HSSP+
1 HSMIC-
3 HSSP-
4 HSMIC+
C320 K0.01u
D217
L284 NC
C292 50V2.2u
L287 330
J214 0

-20dBm (VS CN203 ③ - ④)

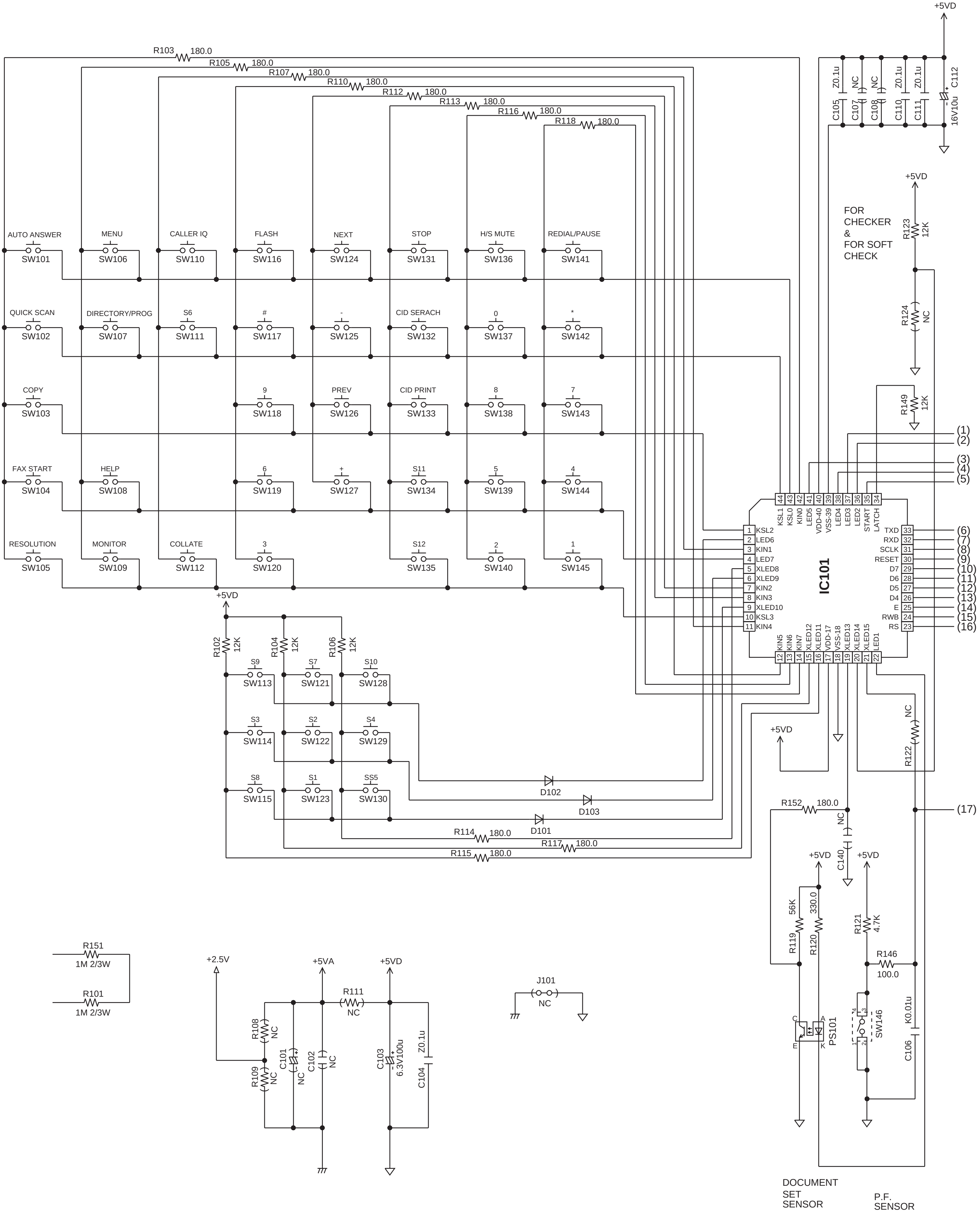
-21dBm (VS CN203 ③ - ④)

-21dBm (VS AG)

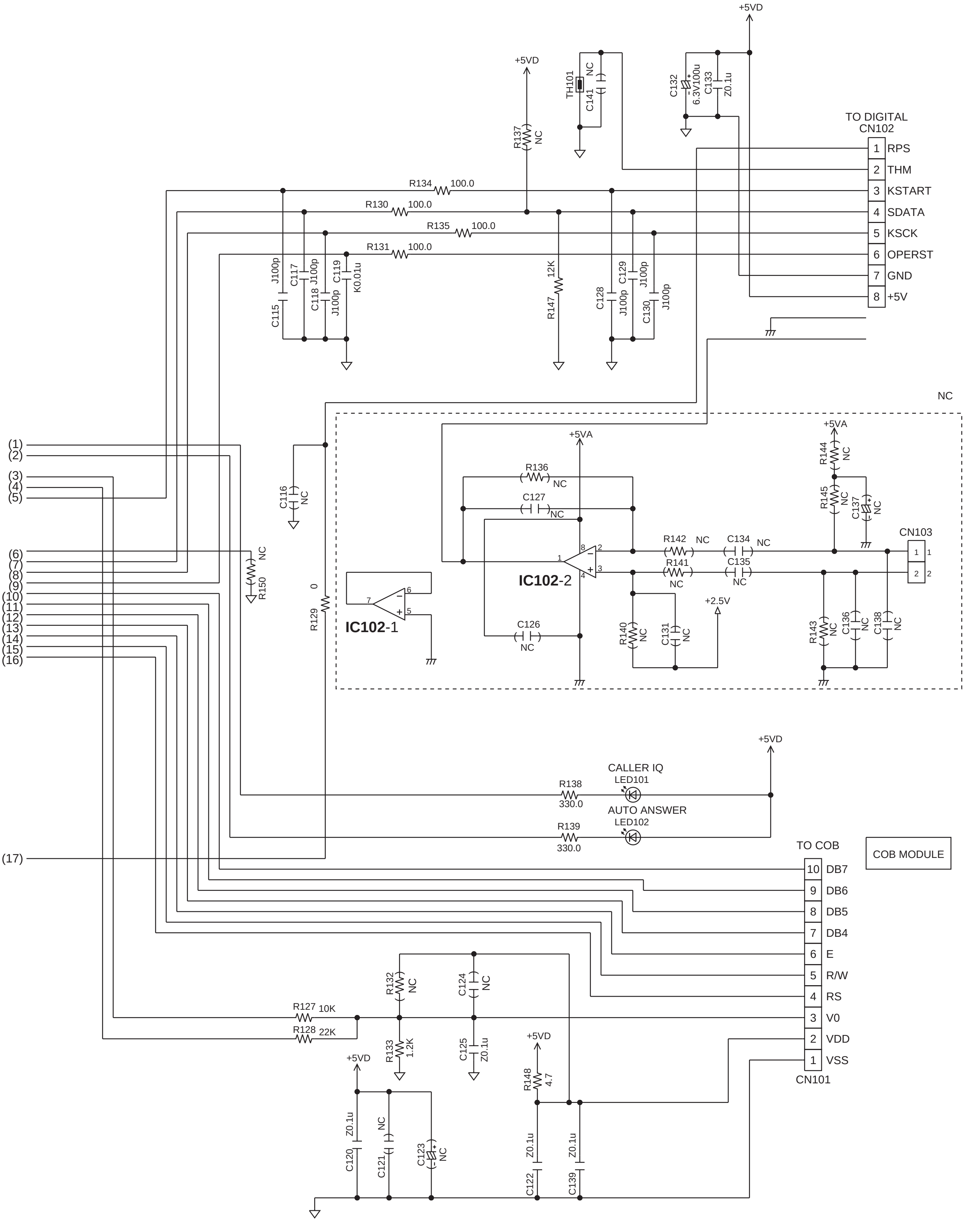
-30dBm (VS AG)

FAX TX
FAX RX

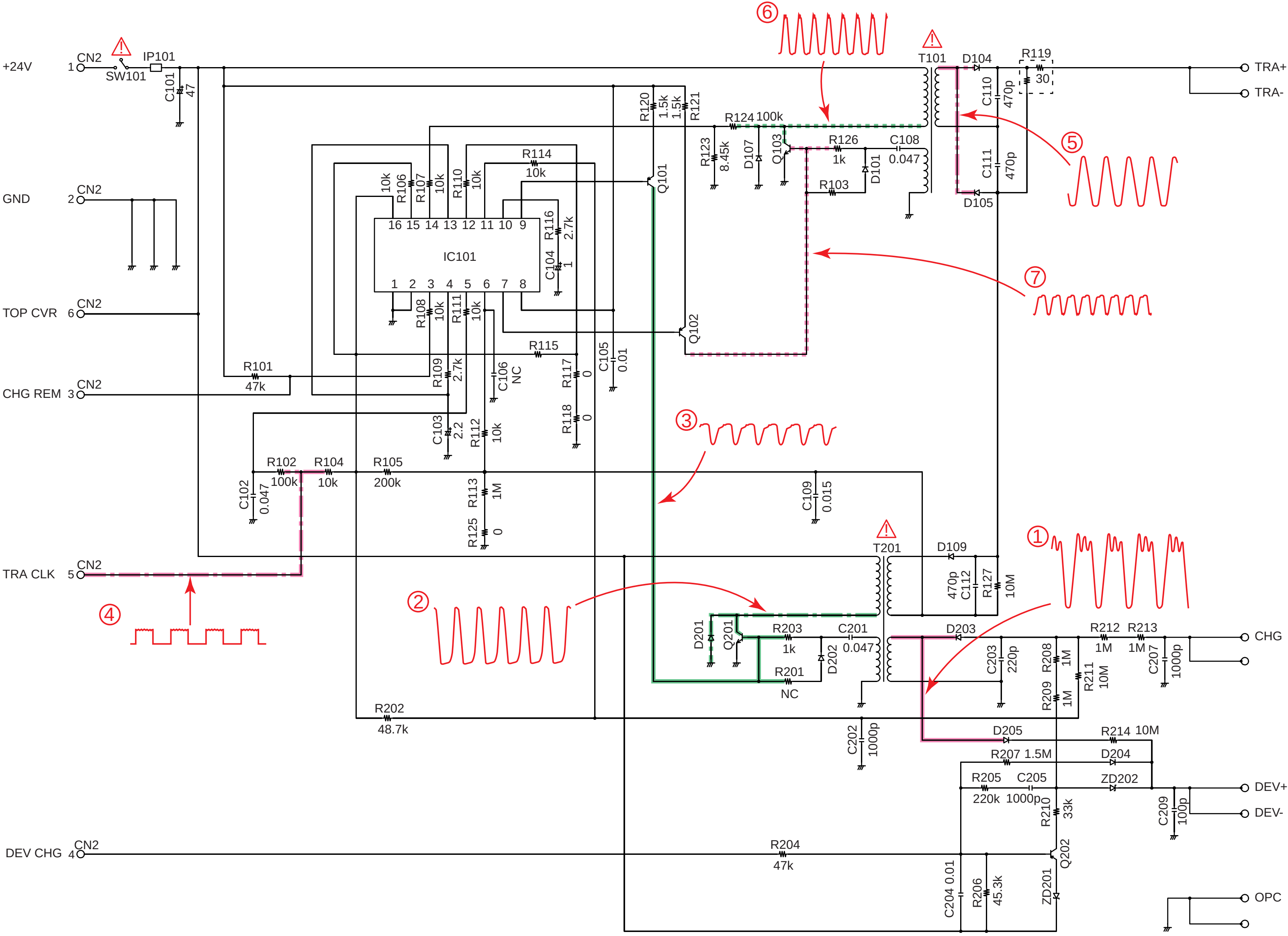
KX-FL512CX ANALOG BOARD (PCB2) 2/2


+5VD
R103 180.0
R105 180.0
R107 180.0
R110 180.0
R112 180.0
R113 180.0
R116 180.0
R118 180.0
C105 Z0.1u
C107 NC
C108 NC
C110 Z0.1u
C111 Z0.1u
C112 16V10u
FOR CHECKER & FOR SOFT CHECK
R123 12K
R124 NC
R149 12K
AUTO ANSWER SW101
MENU SW106
CALLER IQ SW110
FLASH SW116
NEXT SW124
STOP SW131
H/S MUTE SW136
REDIAL/PAUSE SW141
QUICK SCAN SW102
DIRECTORY/PROG SW107
S6 SW111
# SW117
- SW125
CID SERACH SW132
0 SW137
* SW142
COPY SW103
9 SW118
PREV SW126
CID PRINT SW133
8 SW138
7 SW143
FAX START SW104
HELP SW108
6 SW119
+ SW127
S11 SW134
5 SW139
4 SW144
RESOLUTION SW105
MONITOR SW109
COLLATE SW112
3 SW120
S12 SW135
2 SW140
1 SW145
IC101
1 KSL2
2 LED6
3 KIN1
4 LED7
5 XLED8
6 XLED9
7 KIN2
8 KIN3
9 XLED10
10 KSL3
11 KIN4
12 KIN5
13 KIN6
14 KIN7
15 XLED12
16 XLED11
17 VDD-17
18 VSS-18
19 XLED13
20 XLED14
21 XLED15
22 LED1
23 RS
24 RWB
25 E
26 D4
27 D5
28 D6
29 D7
30 RESET
31 SCLK
32 RXD
33 TXD
34 LATCH
35 START
36 LED2
37 LED3
38 LED4
39 VSS-39
40 VDD-40
41 LED5
42 KIN0
43 KSL0
44 KSL1
(1)
(2)
(3)
(4)
(5)
(6)
(7)
(8)
(9)
(10)
(11)
(12)
(13)
(14)
(15)
(16)
(17)
R102 12K
R104 12K
R106 12K
S9 SW113
S7 SW121
S10 SW128
S3 SW114
S2 SW122
S4 SW129
S8 SW115
S1 SW123
SS5 SW130
D102
D103
D101
R114 180.0
R117 180.0
R115 180.0
R122 NC
R152 180.0
C140 NC
R119 56K
R120 330.0
R121 4.7K
R146 100.0
PS101
C E A K
SW146
1 2 3 4
C106 K0.01u
DOCUMENT SET SENSOR
P.F. SENSOR
R151 1M 2/3W
R101 1M 2/3W
+2.5V
+5VA
R108 NC
R109 NC
C101 NC
C102 NC
R111 NC
C103 6.3V100u
C104 Z0.1u
J101 NC

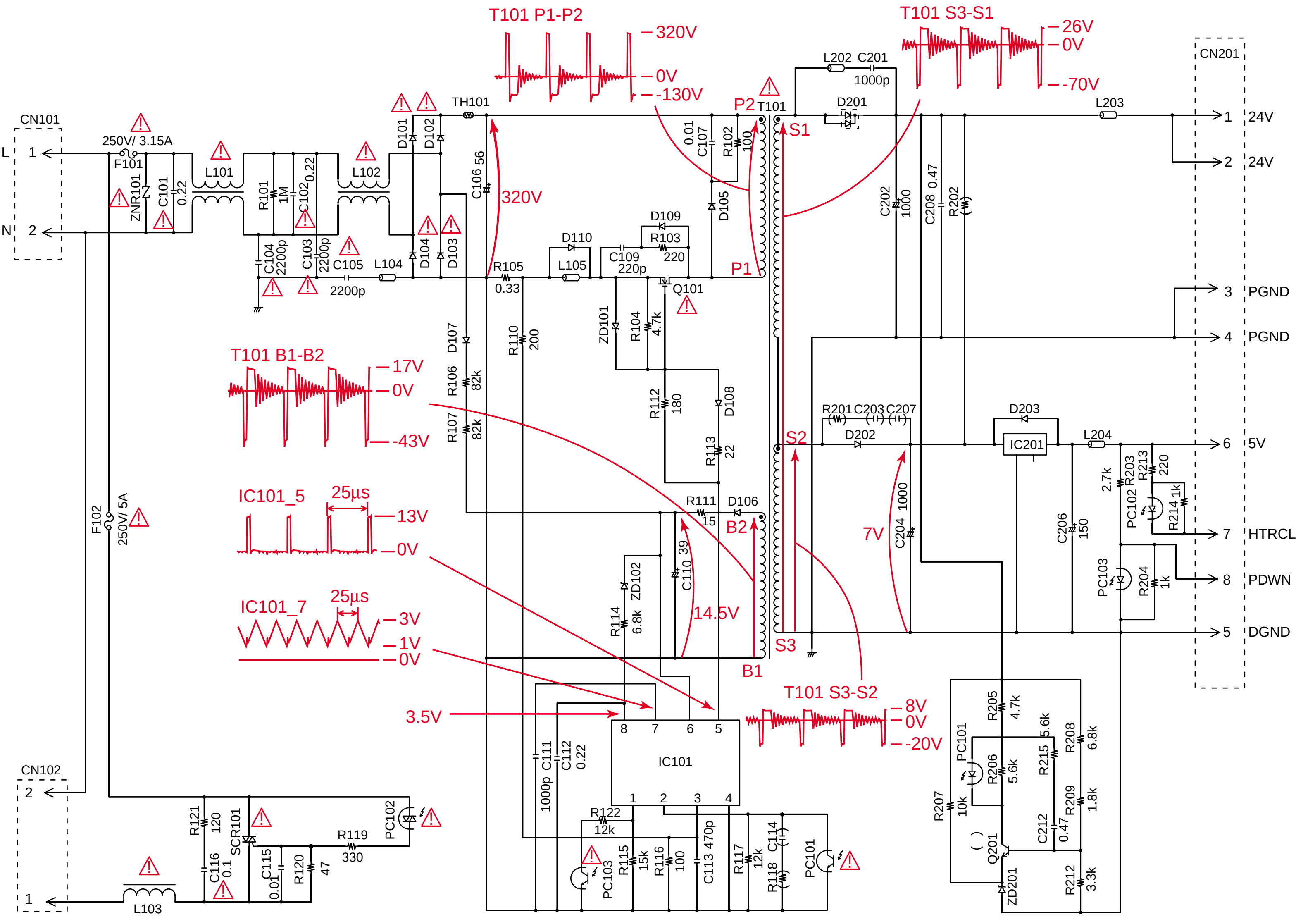
KX-FL512CX OPERATION BOARD (PCB3) 1/2


+5VD
+5VD
TH101
NC
C141
C132
6.3V100u
C133
Z0.1u
TO DIGITAL
CN102
1 RPS
2 THM
3 KSTART
4 SDATA
5 KSCK
6 OPERST
7 GND
8 +5V
R137
NC
R134 100.0
R130 100.0
R135 100.0
R131 100.0
J100p
C115
C117
J100p
C118
J100p
C119
K0.01u
12K
R147
C128
J100p
C129
J100p
C130
J100p
NC
(1)
(2)
(3)
(4)
(5)
(6)
(7)
(8)
(9)
(10)
(11)
(12)
(13)
(14)
(15)
(16)
(17)
C116
NC
NC
R150
0
R129
+5VA
R136
NC
C127
NC
IC102-2
IC102-1
C126
NC
+5VA
R144
NC
R145
NC
C137
NC
R142 NC
C134 NC
R141
NC
C135
NC
CN103
+2.5V
R140
NC
C131
NC
R143
NC
C136
NC
C138
NC
+5VD
CALLER IQ
LED101
R138
330.0
AUTO ANSWER
LED102
R139
330.0
TO COB
COB MODULE
10 DB7
9 DB6
8 DB5
7 DB4
6 E
5 R/W
4 RS
3 V0
2 VDD
1 VSS
CN101
R132
NC
C124
NC
R127 10K
R128 22K
R133
1.2K
C125
Z0.1u
+5VD
R148
4.7
+5VD
Z0.1u
C120
NC
C121
C123
NC
Z0.1u
C122
Z0.1u
C139

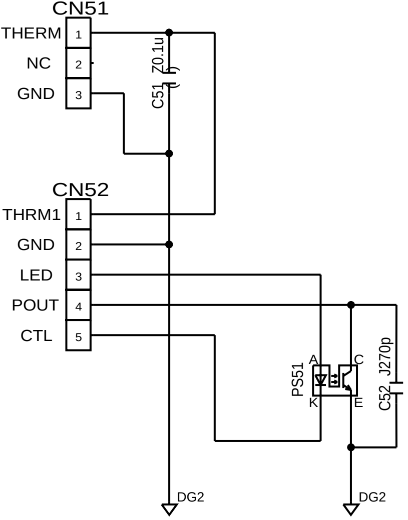
KX-FL512CX OPERATION BOARD (PCB3) 2/2


+24V
CN2 1
SW101
IP101
C101 47
GND
CN2 2
TOP CVR
CN2 6
CHG REM
CN2 3
TRA CLK
CN2 5
DEV CHG
CN2 4
⑥
⑤
⑦
③
①
②
④
T101
D104
R119 30
TRA+
TRA-
C110 470p
C111 470p
D105
R120 1.5k
R121 1.5k
R124 100k
R123 8.45k
D107
Q103
R126 1k
C108 0.047
D101
R103
Q101
Q102
IC101
16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8
R106 10k
R107 10k
R110 10k
R114 10k
R116 2.7k
C104 1
R108 10k
R111 10k
R115
R101 47k
R109 2.7k
C106 NC
R117 0
R118 0
C105 0.01
C103 2.2
R112 10k
R102 100k
R104 10k
R105 200k
R113 1M
R125 0
C102 0.047
C109 0.015
T201
D109
C112 470p
R127 10M
D201
Q201
R203 1k
C201 0.047
D202
R201 NC
D203
C203 220p
R208 1M
R209 1M
R211 10M
R212 1M
R213 1M
C207 1000p
CHG
R202 48.7k
C202 1000p
D205
R214 10M
R207 1.5M
D204
R205 220k
C205 1000p
ZD202
DEV+
DEV-
C209 100p
R210 33k
R204 47k
C204 0.01
R206 45.3k
ZD201
Q202
OPC

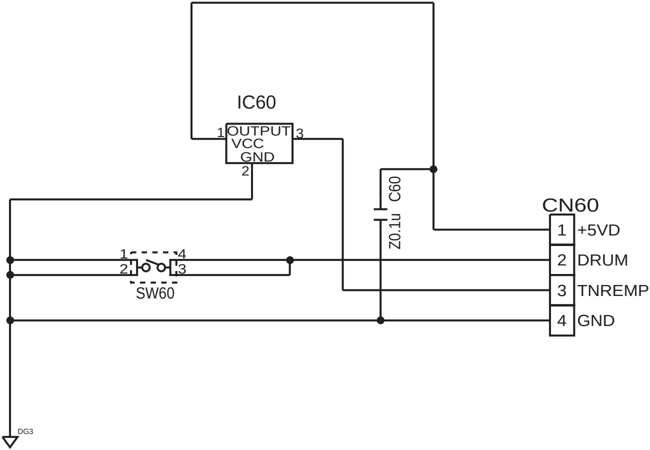
KX-FL512CX HIGH VOLTAGE POWER SUPPLY BOARD (PCB4)


T101 P1-P2
320V
0V
-130V
T101 S3-S1
26V
0V
-70V
CN201
CN101
L
1
N
2
250V/ 3.15A
F101
ZNR101
C101
0.22
L101
R101
1M
C102
0.22
L102
C104
2200p
C103
2200p
C105
2200p
L104
D101
D102
D103
D104
TH101
C106 56
320V
R105
0.33
D110
L105
C109
220p
D109
R103
220
Q101
0.01
C107
R102
100
D105
P2
T101
P1
S1
L202
C201
1000p
D201
L203
C202
1000
C208 0.47
R202
1 24V
2 24V
3 PGND
4 PGND
6 5V
7 HTRCL
8 PDWN
5 DGND
D107
R106
82k
R107
82k
R110
200
ZD101
R104
4.7k
R112
180
D108
R113
22
T101 B1-B2
17V
0V
-43V
IC101_5
25µs
13V
0V
IC101_7
25µs
3V
1V
0V
3.5V
R111
15
D106
B2
C110 39
14.5V
ZD102
R114
6.8k
B1
S2
S3
7V
C204 1000
R201
C203
C207
D202
D203
IC201
L204
C206
150
R203
2.7k
R213
220
R214 1k
PC102
PC103
R204
1k
T101 S3-S2
8V
0V
-20V
IC101
8
7
6
5
1
2
3
4
C111
1000p
C112
0.22
R122
12k
PC103
R115
15k
R116
100
C113 470p
R117
12k
C114
R118
PC101
F102
250V/ 5A
CN102
2
1
L103
R121
120
C116
0.1
SCR101
C115
0.01
R120
47
R119
330
PC102
R205
4.7k
R206
5.6k
R215
5.6k
R208
6.8k
PC101
R207
10k
Q201
C212
0.47
R209
1.8k
ZD201
R212
3.3k

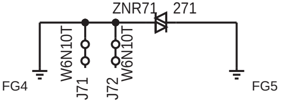
KX-FL512CX LOW VOLTAGE POWER SUPPLY BOARD (PCB5)


CN51
THERM
NC
GND
1
2
3
C51
Z0.1u
CN52
THRM1
GND
LED
POUT
CTL
1
2
3
4
5
PS51
A
K
C
E
C52
J270p
DG2
DG2

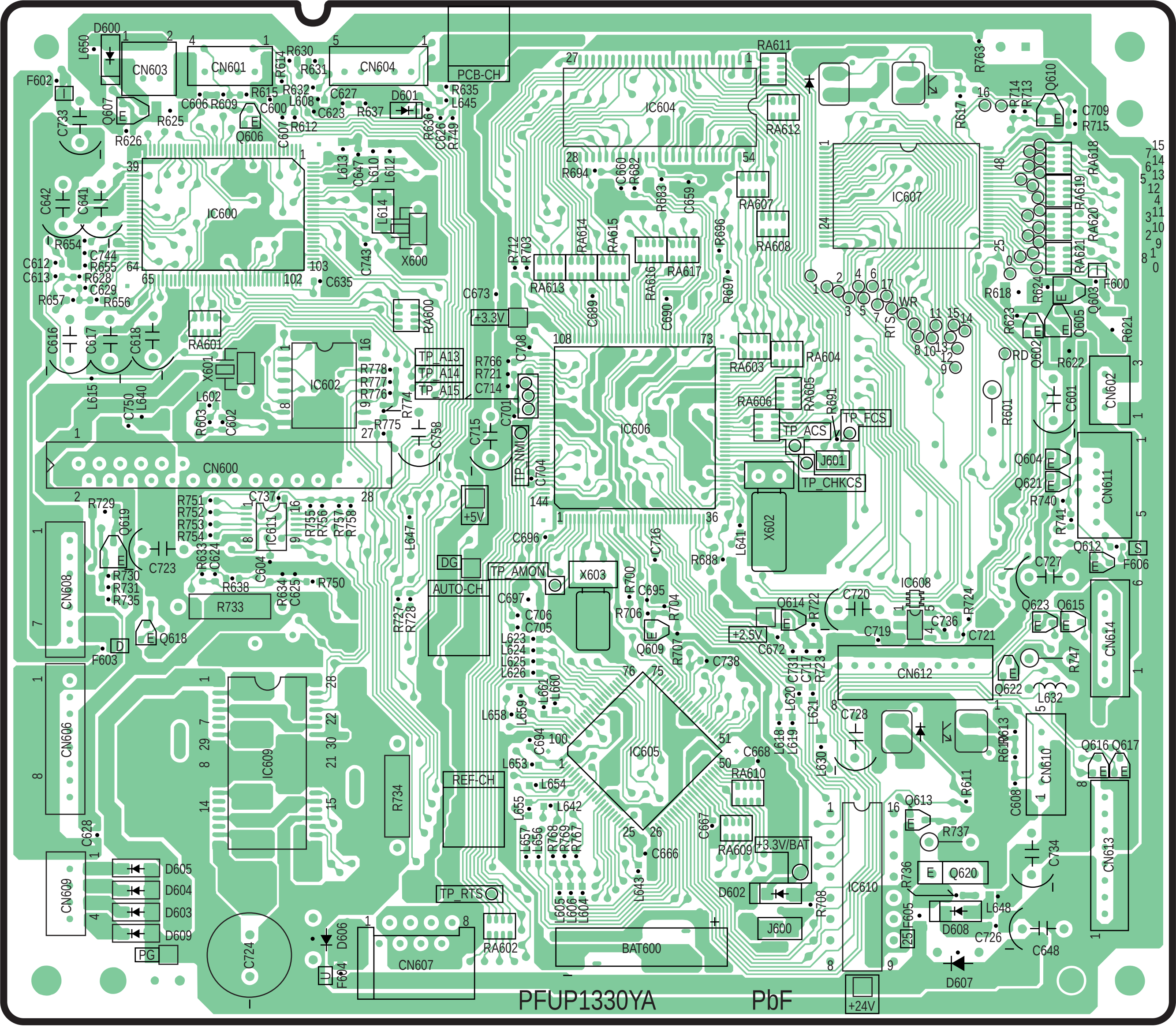
FL512CX EXIT SENSOR BOARD (PCB6)


IC60
1
OUTPUT
3
VCC
GND
2
C60
Z0.1u
CN60
1
+5VD
2
DRUM
3
TNREMP
4
GND
1
4
2
3
SW60
DG3

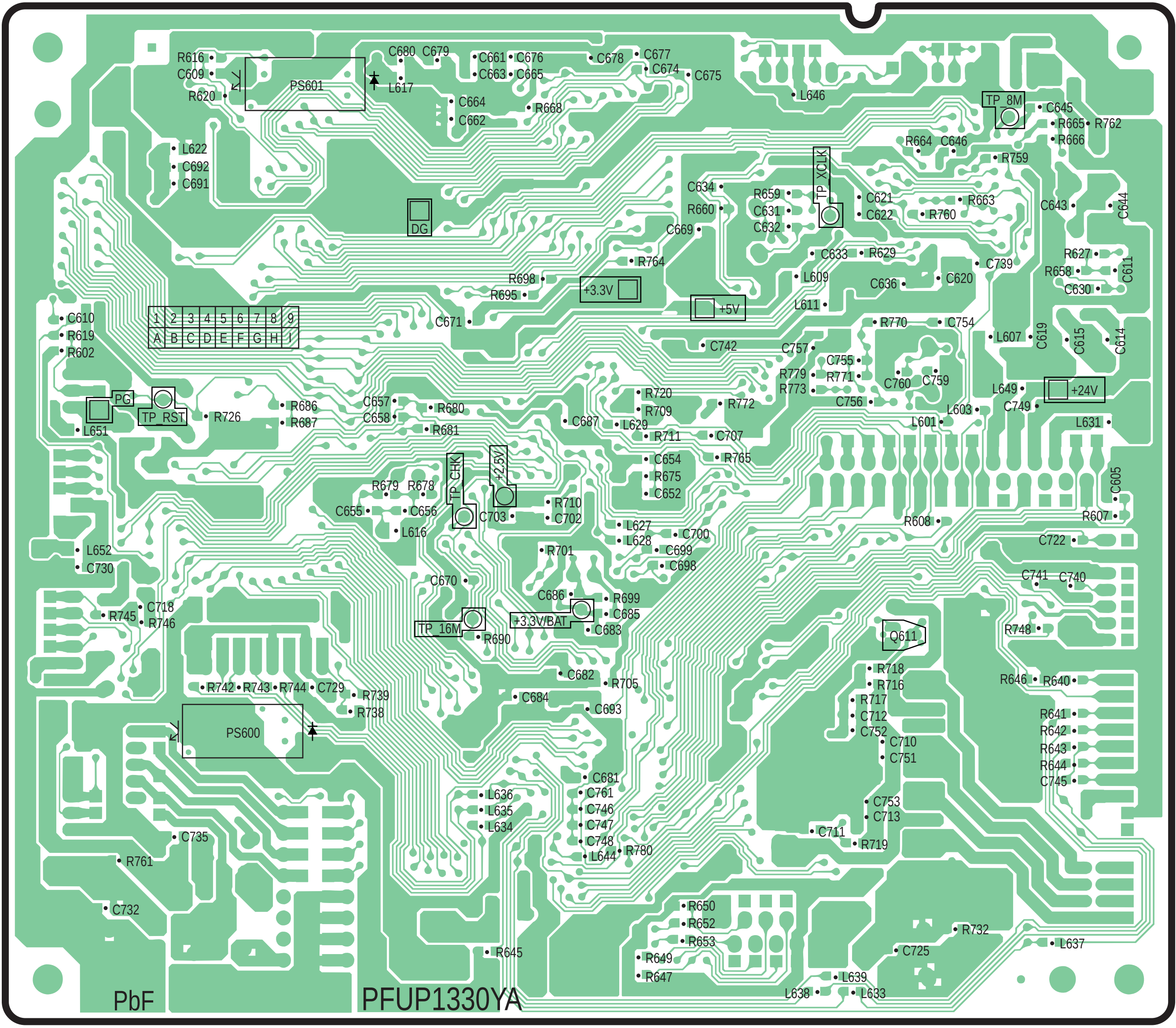
KX-FL512CX DRUM AND TONER SENSOR BOARD(PCB7)


ZNR71
271
W6N10T
W6N10T
J71
J72
FG4
FG5

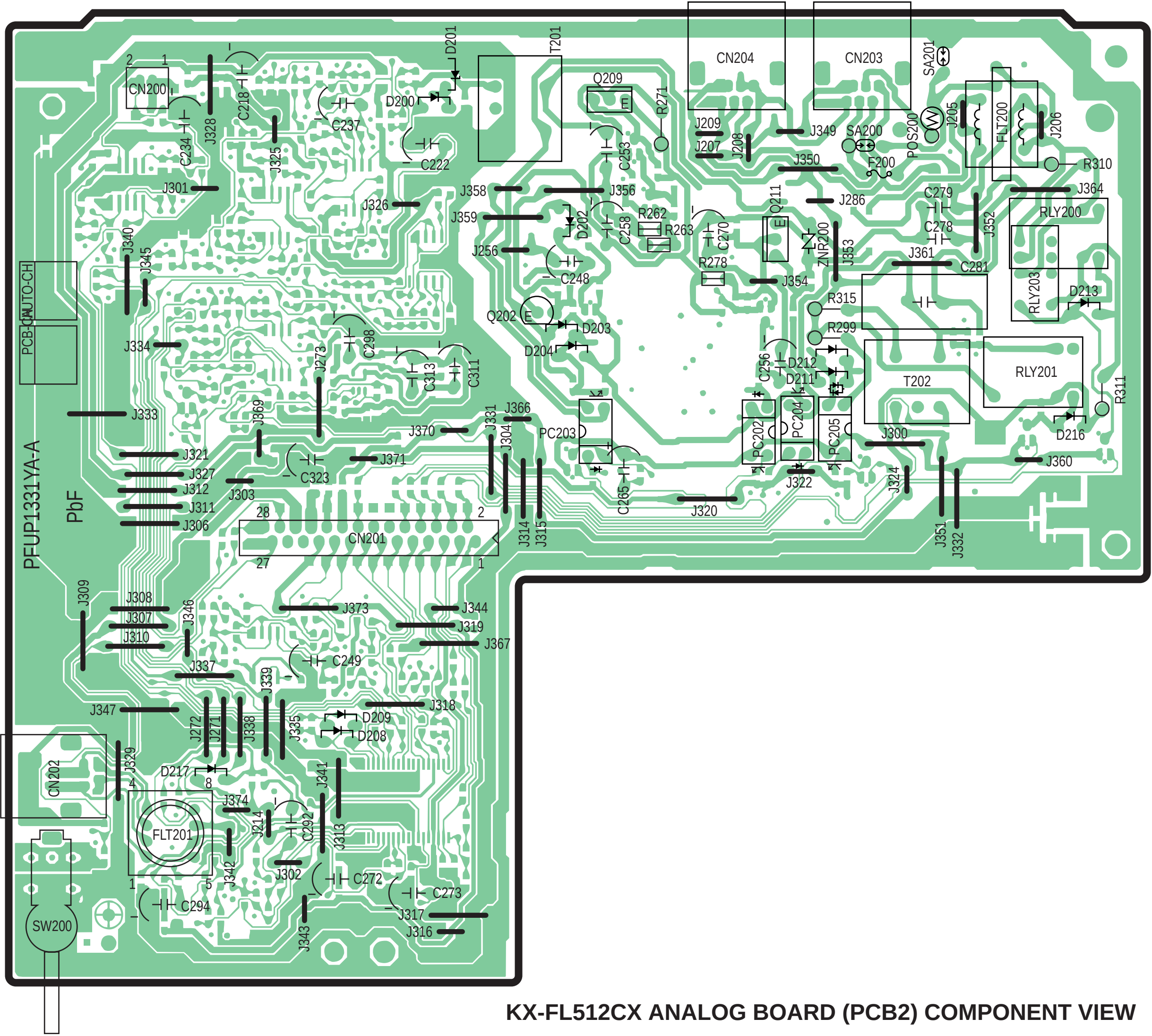
KX-FL512CX VARISTOR BOARD(PCB8)


PFUP1330YA
PbF
IC600
IC602
IC604
IC605
IC606
IC607
IC608
IC609
IC610
IC611
CN600
CN601
CN602
CN603
CN604
CN606
CN607
CN608
CN609
CN610
CN611
CN612
CN613
CN614
PCB-CH
AUTO-CH
REF-CH
BAT600
X600
X601
X602
X603
J600
J601
D600
D601
D602
D603
D604
D605
D606
D607
D608
D609
F600
F602
F603
F604
F606
+3.3V
+5V
+2.5V
+3.3V/BAT
+24V
TP_A13
TP_A14
TP_A15
TP_NMI
TP_AMON
TP_RTS
TP_ACS
TP_FCS
TP_CHKCS
DG
PG
RD
WR
RTS
R733
R734
C724
RA600
RA601
RA602
RA603
RA604
RA605
RA606
RA607
RA608
RA609
RA610
RA611
RA612
RA613
RA614
RA615
RA616
RA617
RA618
RA619
RA620
RA621
Q603
Q604
Q605
Q606
Q607
Q609
Q610
Q612
Q613
Q614
Q615
Q616
Q617
Q618
Q619
Q620
Q621
Q622
Q623

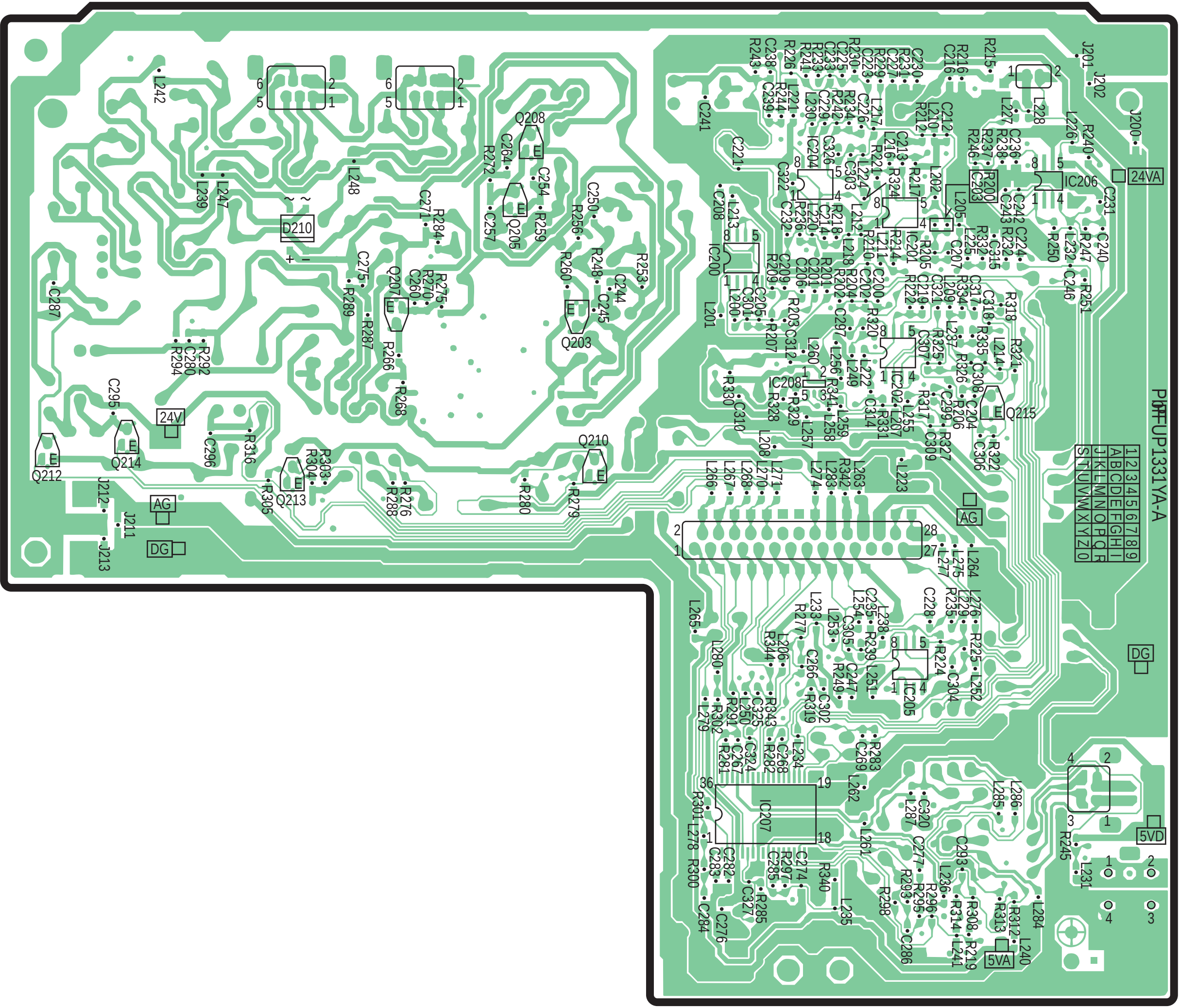
KX-FL512CX DIGITAL BOARD (PCB4) COMPONENT VIEW


R616
C609
R620
PS601
C680
C679
L617
C661
C676
C663
C665
C678
C677
C674
C675
C664
C662
R668
L646
TP_8M
C645
R665
R762
R666
L622
C692
C691
R664
C646
R759
TP_XCLK
R659
C631
C632
C634
R660
C621
C622
R663
R760
C643
C644
DG
C669
R764
C633
R629
C739
R627
R658
C611
C630
R698
R695
+3.3V
L609
C636
C620
L611
+5V
1 2 3 4 5 6 7 8 9
A B C D E F G H I
C610
R619
R602
C671
R770
C754
L607
C619
C615
C614
C742
C757
C755
R779
R771
R773
C760
C759
L649
+24V
PG
TP_RST
R726
L651
R686
R687
C657
C658
R680
R681
R720
R709
C687
L629
R772
C756
L603
C749
L601
L631
R711
C707
C654
R675
C652
R765
TP_CHK
+2.5V
R679
R678
C655
C656
L616
C703
R710
C702
R608
R607
C605
L627
L628
C700
C699
C698
C722
L652
C730
R701
C741
C740
C670
C686
R699
C685
C683
+3.3V/BAT
TP_16M
R690
C718
R745
R746
Q611
R748
R718
R716
R646
R640
R742
R743
R744
C729
R739
R738
C682
R705
C684
C693
R717
C712
C752
C710
C751
R641
R642
R643
R644
C745
PS600
C681
C761
C746
C747
C748
L644
R780
L636
L635
L634
C753
C713
C711
R719
C735
R761
C732
R650
R652
R653
R649
R647
R645
R732
C725
L637
L639
L638
L633
PbF
PFUP1330YA

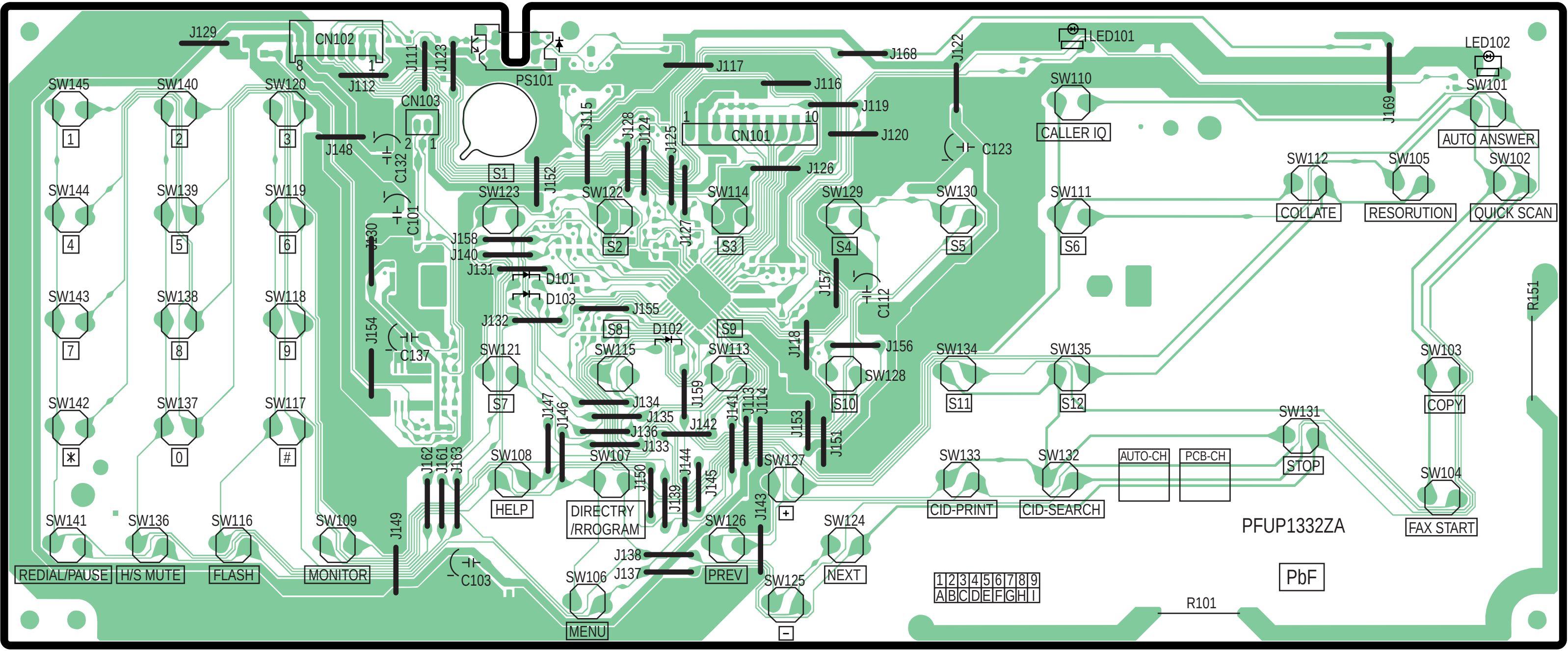
KX-FL512CX DIGITAL BOARD (PCB4) BOTTOM VIEW


CN200
2
1
J328
C218
C234
C237
D200
D201
T201
J325
C222
Q209
E
R271
CN204
CN203
SA201
J209
J207
J208
J349
SA200
POS200
J205
FLT200
J206
C253
J350
F200
R310
J301
J326
J358
J356
J359
D202
C258
R262
R263
C270
Q211
E
ZNR200
J353
J286
C279
C278
J352
J364
RLY200
J256
C248
R278
J354
J361
C281
J340
J345
PCB-CH
AUTO-CH
Q202
E
D203
D204
R315
R299
RLY203
D213
J334
C298
J273
C313
C311
C256
D212
D211
T202
RLY201
R311
J333
J369
J331
J366
J370
J304
PC203
PC202
PC204
PC205
J300
D216
J321
J327
J312
J311
J306
J303
C323
J371
J360
C265
J322
J324
J320
J314
J315
J351
J332
PFUP1331YA-A
PbF
28
2
CN201
27
1
J309
J308
J307
J310
J346
J373
J344
J319
J367
C249
J337
J339
J347
J318
D209
D208
J272
J271
J338
J335
J329
4
D217
8
CN202
J374
J341
FLT201
J214
C292
J313
J342
J302
1
5
C272
C273
C294
J317
J316
SW200
J343

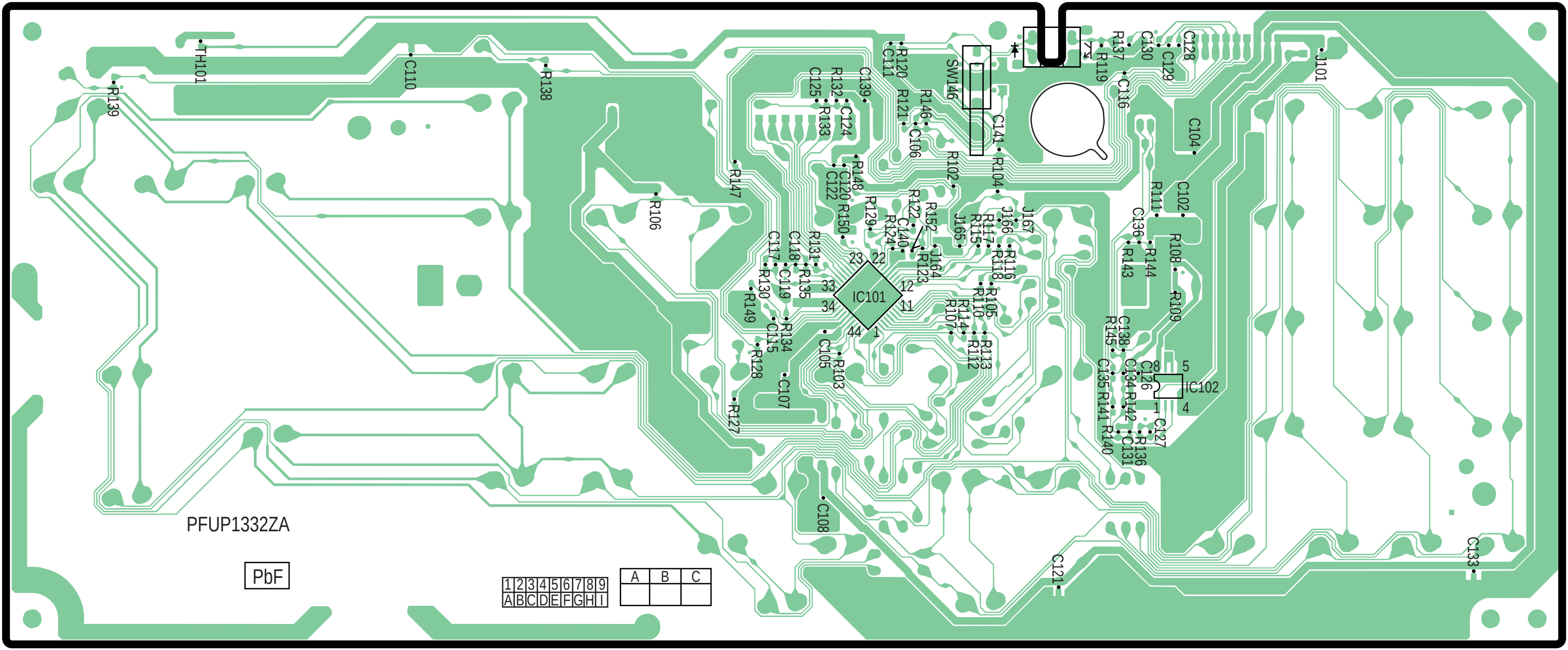
KX-FL512CX ANALOG BOARD (PCB2) COMPONENT VIEW


PFUP1331YA-A
J201
J202
J200
24VA
IC206
C231
R240
L226
L228
L227
R215
R216
C216
C230
R231
C227
R229
C223
R230
C225
C233
R233
R241
R226
C238
R243
C241
C221
R244
C239
L221
L230
C229
R242
R234
C226
L217
R212
L210
C212
R246
R237
R238
C236
C203
R200
IC204
C326
C303
L224
R221
L216
C213
R324
R217
L202
L205
C242
C243
R232
C224
R250
R247
C240
L232
C246
R251
C322
C208
L213
C232
R236
L220
C214
R218
L212
L218
R210
L211
R214
IC201
R205
C207
L225
R332
C315
IC200
R209
C209
C206
C201
R201
R202
R204
C202
C200
R222
C219
C321
L209
R334
C317
C318
R318
L201
L200
C301
C205
R207
R203
C312
L260
L256
C297
L249
L222
R320
IC202
C307
R325
R326
R335
C308
L214
R321
Q215
IC208
R330
C310
R328
R329
R341
L258
L259
C314
R331
L207
L255
R317
C299
R206
C204
C309
R327
C306
R322
L208
L257
L266
L270
L267
L268
L271
L274
L283
R342
L263
L223
AG
L275
L277
L264
L265
L233
R277
L253
C305
L254
C235
L238
R239
L251
C228
L276
L229
R235
R225
L252
R224
C304
IC205
L206
R344
C266
R249
C247
R319
C302
L280
L279
R302
R291
L250
C325
R343
R281
C267
C324
R282
C268
L234
C269
R283
L262
IC207
R301
L278
R300
C283
C282
C285
R297
C274
R340
C327
R285
C284
C276
L235
L261
L287
C320
L285
L286
R245
L231
5VD
C277
R293
R298
C286
C293
L236
R295
R296
R314
L241
R308
R219
R313
R312
L240
L284
5VA
DG
L242
L239
L247
D210
L248
C271
R284
C264
R272
Q208
C254
Q205
C257
R259
C250
R256
R260
R248
C244
C245
R253
Q203
C275
Q207
C260
R270
R275
R289
R287
R266
R268
C287
C280
R292
R294
C295
24V
Q214
Q212
C296
R316
Q213
R303
R304
R305
R288
R276
R280
R279
Q210
J212
J211
J213
DG
AG

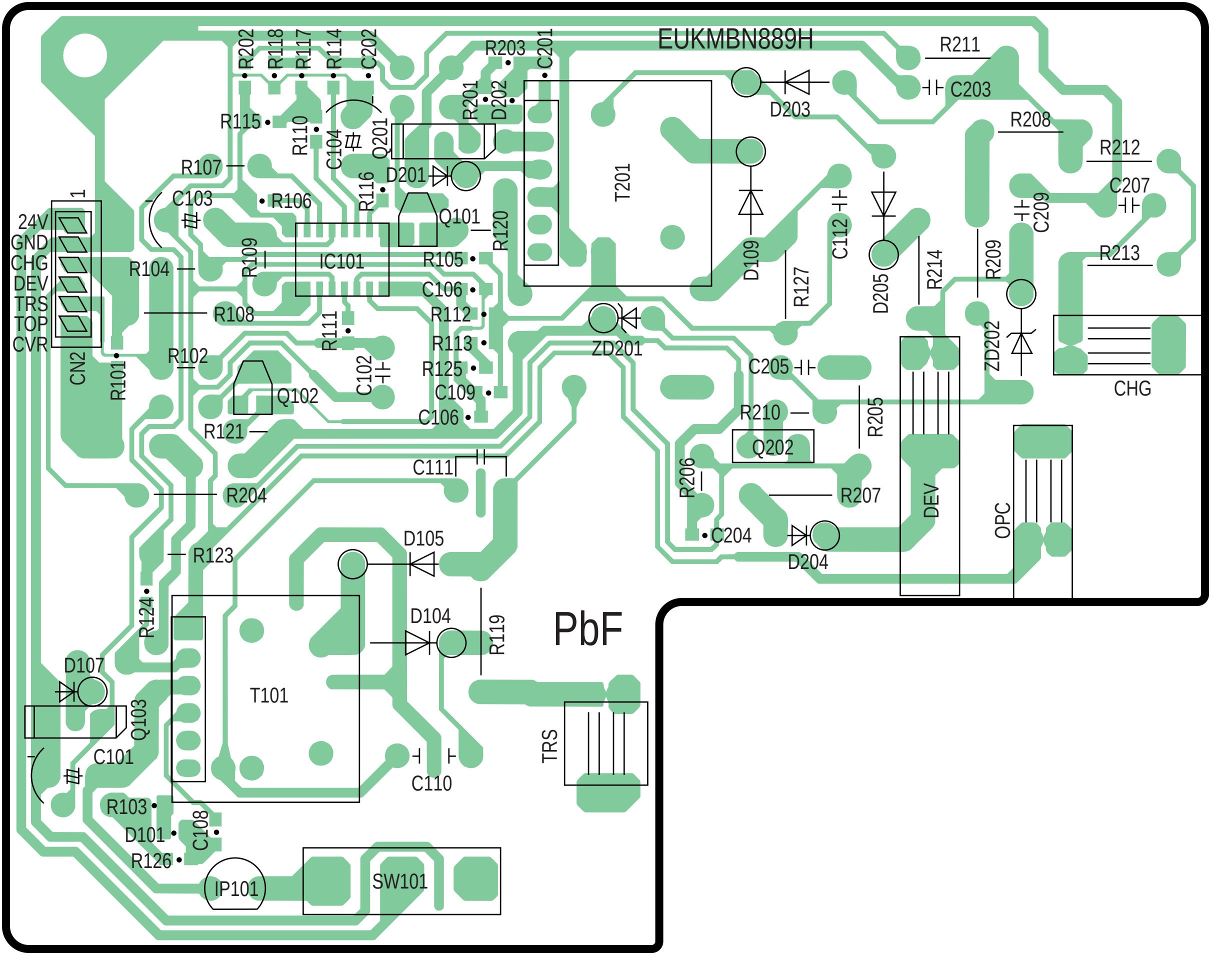
KX-FL512CX ANALOG BOARD (PCB2) BOTTOM VIEW


J129
CN102
8
1
J111
J123
J112
PS101
LED101
J168
J122
LED102
J117
J116
J119
J120
J126
J169
SW145
SW140
SW120
SW110
SW101
1
2
3
CALLER IQ
AUTO ANSWER
CN103
2
1
J148
C132
J115
J128
J124
J125
1
10
CN101
C123
S1
J152
SW112
SW105
SW102
SW144
SW139
SW119
SW123
SW122
SW114
SW129
SW130
SW111
COLLATE
RESORUTION
QUICK SCAN
C101
J127
4
5
6
J158
J140
J131
S2
S3
S4
S5
S6
J130
D101
D103
J157
C112
R151
SW143
SW138
SW118
J155
7
8
9
J132
S8
D102
S9
J154
SW121
SW115
SW113
J118
J156
SW134
SW135
SW103
C137
SW128
SW142
SW137
SW117
S7
J159
S10
S11
S12
COPY
J147
J146
J134
J135
J136
J133
J142
J141
J113
J114
J153
J151
SW131
✳
0
#
J162
J161
J163
SW108
SW107
SW127
SW133
SW132
AUTO-CH
PCB-CH
STOP
SW104
J150
J144
J145
J139
HELP
DIRECTRY
/RROGRAM
J143
+
CID-PRINT
CID-SEARCH
SW141
SW136
SW116
SW109
J149
SW126
SW124
PFUP1332ZA
FAX START
J138
J137
REDIAL/PAUSE
H/S MUTE
FLASH
MONITOR
C103
SW106
PREV
NEXT
SW125
1 2 3 4 5 6 7 8 9
A B C D E F G H I
PbF
R101
MENU
−

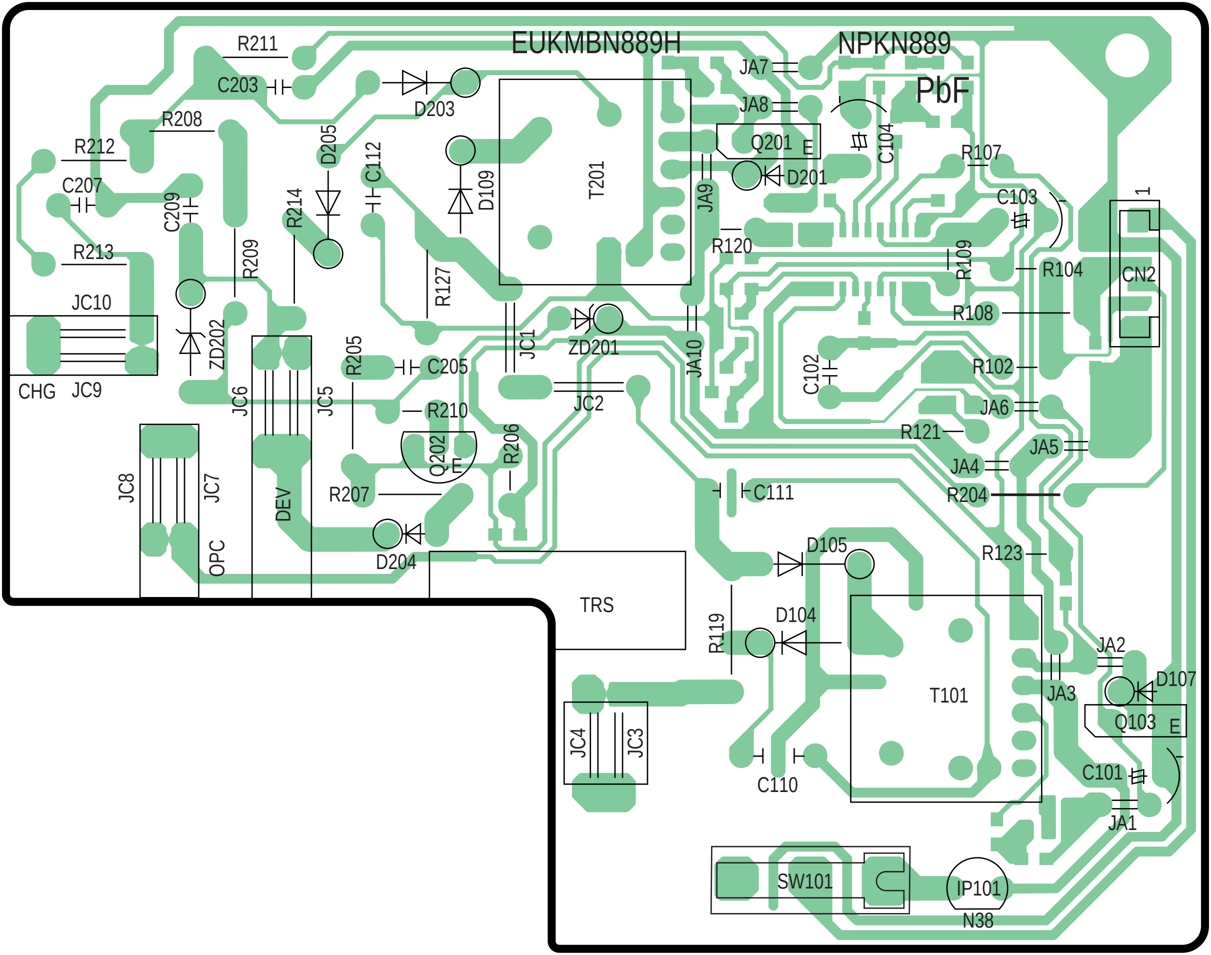
KX-FL512CX OPERATION BOARD (PCB3) COMPONENT VIEW


TH101
C110
R138
R139
R147
R106
C125
R132
C139
R133
C124
C111
R120
R121
R146
C106
SW146
C141
R102
R104
R137
C130
C128
R119
C129
C116
J101
C104
R148
C120
C122
R150
R129
R122
R152
R124
C140
J165
R117
R115
J166
J167
R111
C102
C136
R108
R144
R143
R118
R116
R123
J164
C117
C118
R131
R135
C119
R130
R149
23
22
33
34
IC101
12
11
44
1
R110
R105
R114
R107
R109
R113
R112
C138
R145
C115
R134
R128
C105
R103
C107
R127
C135
C134
C126
8
5
IC102
1
4
R141
R142
R140
C127
R136
C131
C108
C121
C133
PFUP1332ZA
PbF
1 2 3 4 5 6 7 8 9
A B C D E F G H I
A B C

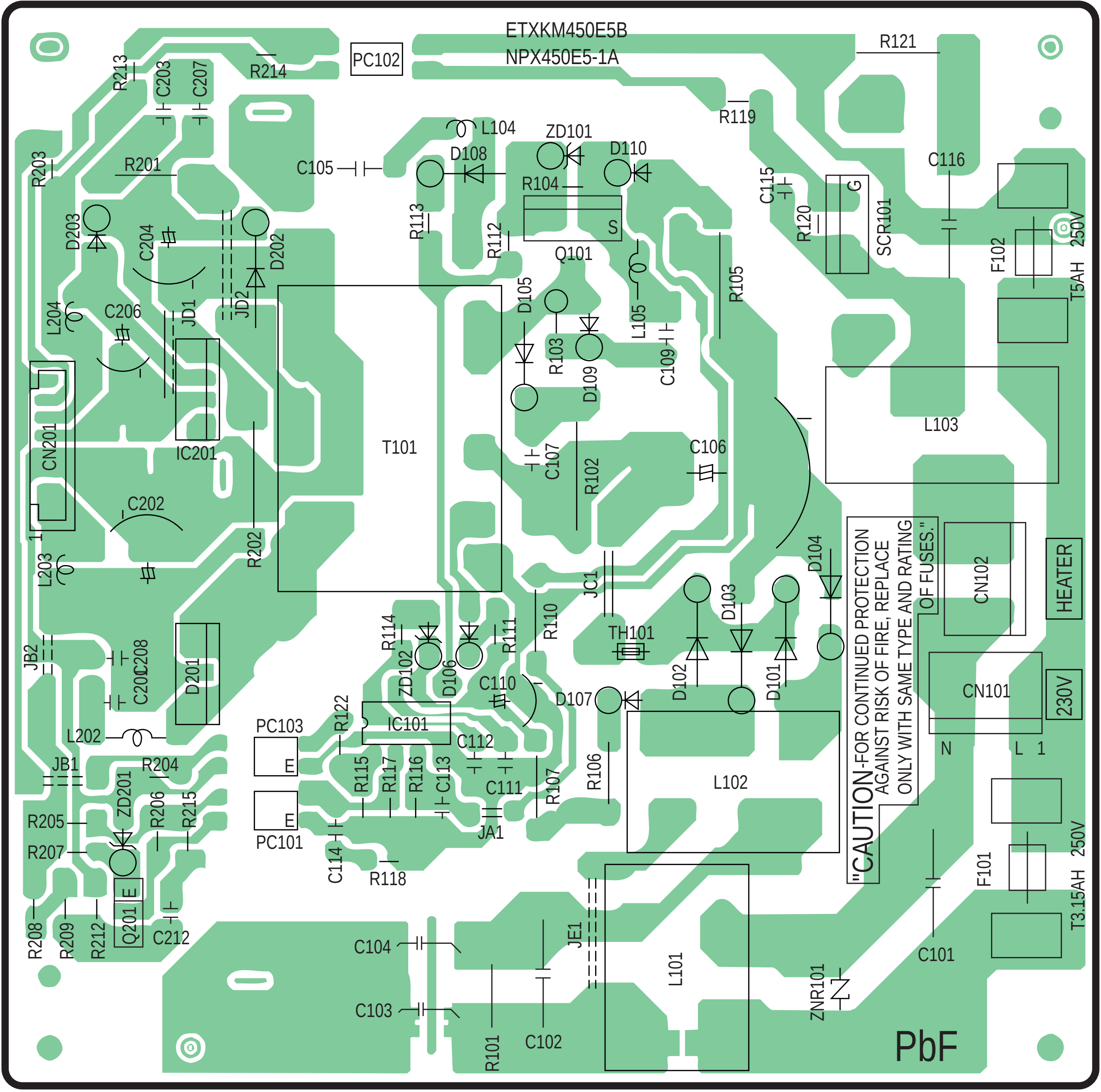
KX-FL512CX OPERATION BOARD (PCB3) BOTTOM VIEW


EUKMBN889H
R202
R118
R117
R114
C202
R203
C201
R211
D203
C203
R208
R212
C207
C209
R213
R115
R110
C104
Q201
R201
D202
R107
D201
T201
C103
R106
R116
Q101
R120
D109
R127
C112
D205
R214
R209
24V
GND
CHG
DEV
TRS
TOP
CVR
1
R104
R109
IC101
R105
C106
R108
R112
R111
ZD201
ZD202
R102
R113
R125
C205
CHG
CN2
R101
Q102
C102
C109
R210
R205
R121
C106
Q202
R206
R207
C111
R204
DEV
OPC
C204
D204
R123
D105
R124
D104
R119
PbF
T101
D107
Q103
TRS
C101
C110
R103
D101
C108
R126
IP101
SW101

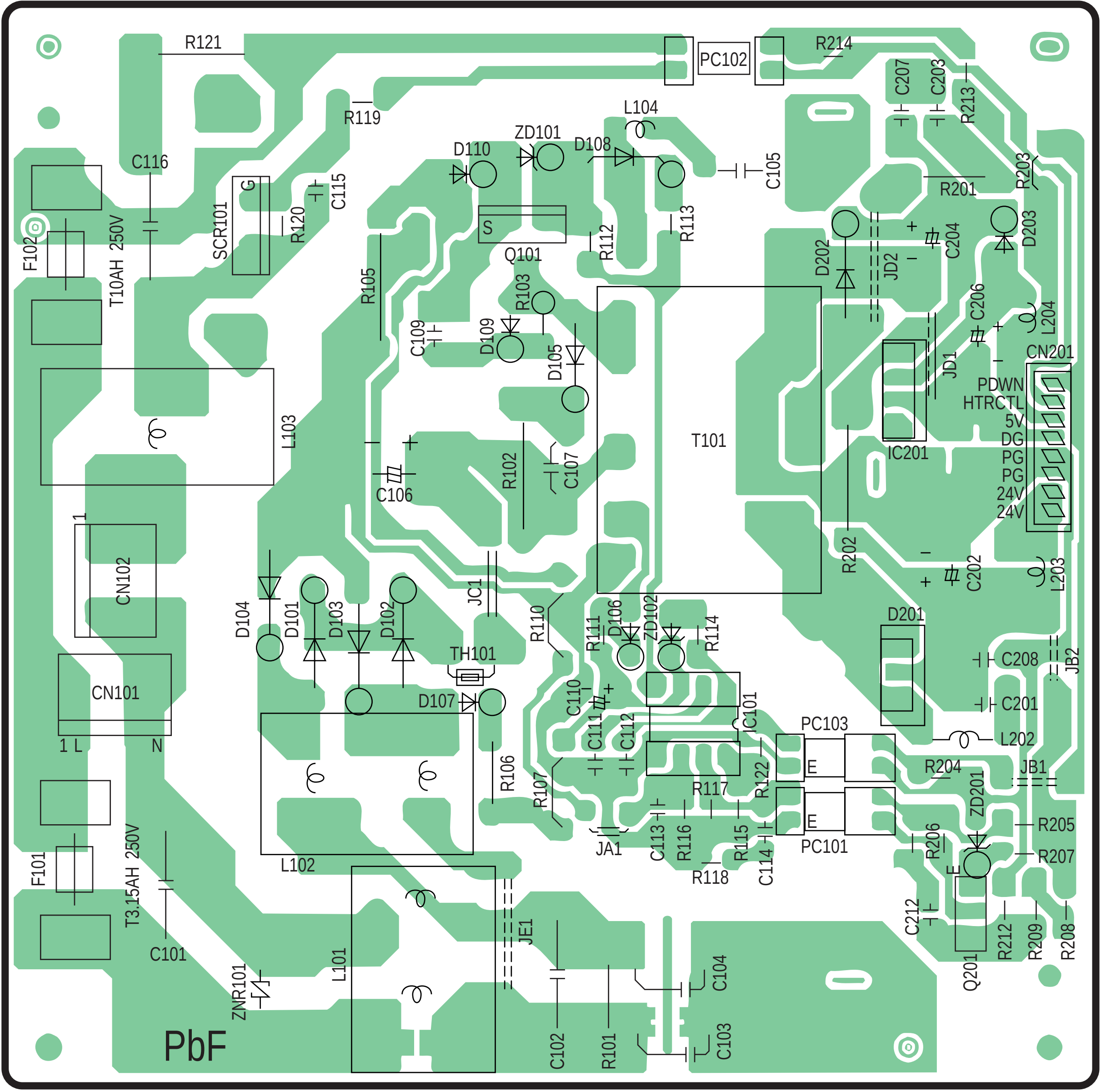
KX-FL512CX HIGH VOLTAGE POWER SUPPLY BOARD (PCB4) COMPONENT VIEW


EUKMBN889H
NPKN889
PbF
R211
C203
D203
T201
JA7
JA8
Q201
E
C104
D201
R107
C103
1
R208
R212
C207
C209
D205
C112
D109
R214
JA9
R120
R109
R104
CN2
R213
R209
R127
R108
JC10
ZD202
JC1
ZD201
JA10
C102
R102
CHG
JC9
R205
C205
JC2
JA6
JC6
JC5
R210
R121
JA5
JC8
JC7
DEV
Q202
E
R206
JA4
R207
C111
R204
OPC
D204
D105
R123
TRS
R119
D104
JA2
T101
D107
JA3
Q103
E
JC4
JC3
C110
C101
JA1
SW101
IP101
N38

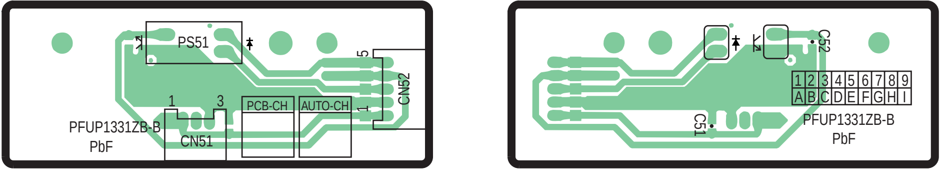
KX-FL512CX HIGH VOLTAGE POWER SUPPLY BOARD (PCB4) BOTTOM VIEW


ETXKM450E5B
NPX450E5-1A
PC102
R213
C203
C207
R214
R121
R119
L104
ZD101
D110
D108
C105
R201
R203
D203
C204
D202
JD1
JD2
R104
Q101
S
G
C115
R120
SCR101
C116
F102
250V
T5AH
R113
R112
D105
R103
D109
L105
C109
R105
L206
C206
L204
CN201
1
IC201
T101
C107
R102
C106
L103
C202
L203
R202
JC1
D104
CN102
HEATER
R110
TH101
D103
D102
D101
D107
CN101
230V
N
L
1
JB2
C208
C209
D201
R114
ZD102
D106
R111
C110
L202
PC103
E
R122
IC101
C112
JB1
R204
ZD201
R206
R215
R115
R117
R116
C113
C111
R107
R106
L102
R205
R207
PC101
E
C114
R118
JA1
F101
250V
T3.15AH
C101
R208
R209
R212
Q201
E
C212
C104
JE1
L101
ZNR101
C103
R101
C102
PbF
"CAUTION-FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE AND RATING OF FUSES."

KX-FL512CX LOW VOLTAGE POWER SUPPLY BOARD (PCB5) COMPONENT VIEW

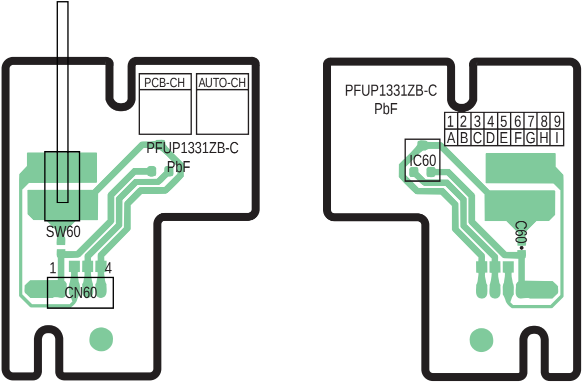

R121
PC102
R214
R119
C207
C203
R213
L104
ZD101
D110
D108
C105
C116
C115
R120
SCR101
G
S
Q101
R112
R113
R201
R203
F102
T10AH 250V
R105
R103
C109
D109
D105
D202
JD2
C204
D203
C206
L204
JD1
CN201
PDWN
HTRCTL
5V
DG
PG
PG
24V
24V
L103
C106
R102
C107
T101
IC201
1
CN102
D104
D101
D103
D102
JC1
R110
R111
D106
ZD102
R114
R202
C202
L203
D201
TH101
D107
C110
C111
C112
IC101
C208
JB2
C201
CN101
1 L
N
PC103
E
L202
R204
JB1
R106
R107
R117
R122
E
PC101
ZD201
R205
JA1
C113
R116
R115
C114
R206
R207
L102
R118
E
F101
T3.15AH 250V
C101
JE1
C212
Q201
R212
R209
R208
L101
C104
ZNR101
PbF
C102
R101
C103

KX-FL512CX LOW VOLTAGE POWER SUPPLY BOARD (PCB5) BOTTOM VIEW


PS51
5
CN52
1
1
3
PCB-CH
AUTO-CH
PFUP1331ZB-B
PbF
CN51
C52
1 2 3 4 5 6 7 8 9
A B C D E F G H I
C51
PFUP1331ZB-B
PbF

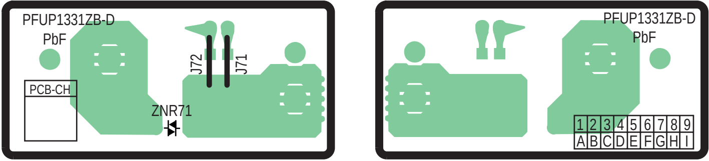
PFUP1331ZB-B (PFUP1331YA-B)

KX-FL512CX EXIT SENSOR BOARD (PCB6)


PCB-CH
AUTO-CH
PFUP1331ZB-C
PbF
SW60
1
4
CN60
PFUP1331ZB-C
PbF
1 2 3 4 5 6 7 8 9
A B C D E F G H I
IC60
C60

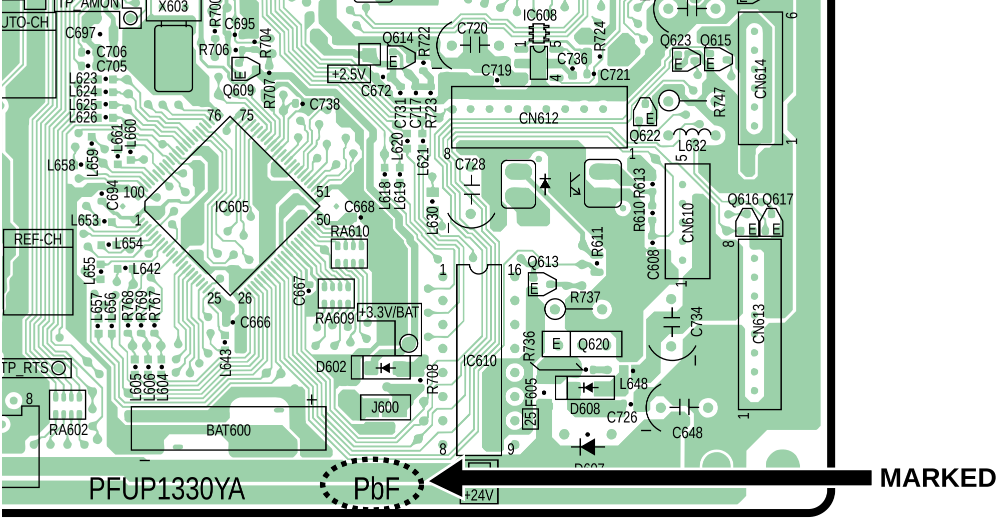
PFUP1331ZB-C (PFUP1331YB-C)

KX-FL512CX DRUM AND TONER SENSOR BOARD/PCB7

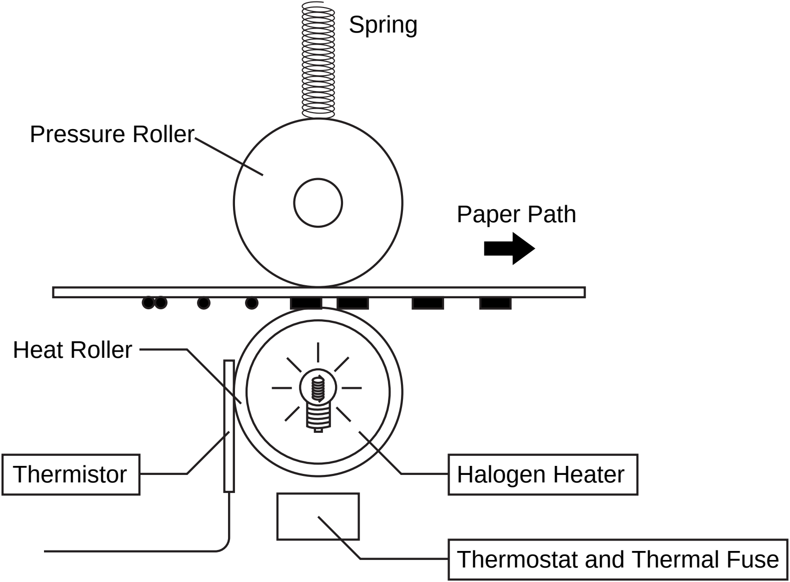

PFUP1331ZB-D
PbF
PCB-CH
J72
J71
ZNR71
PFUP1331ZB-D
PbF
1 2 3 4 5 6 7 8 9
A B C D E F G H I

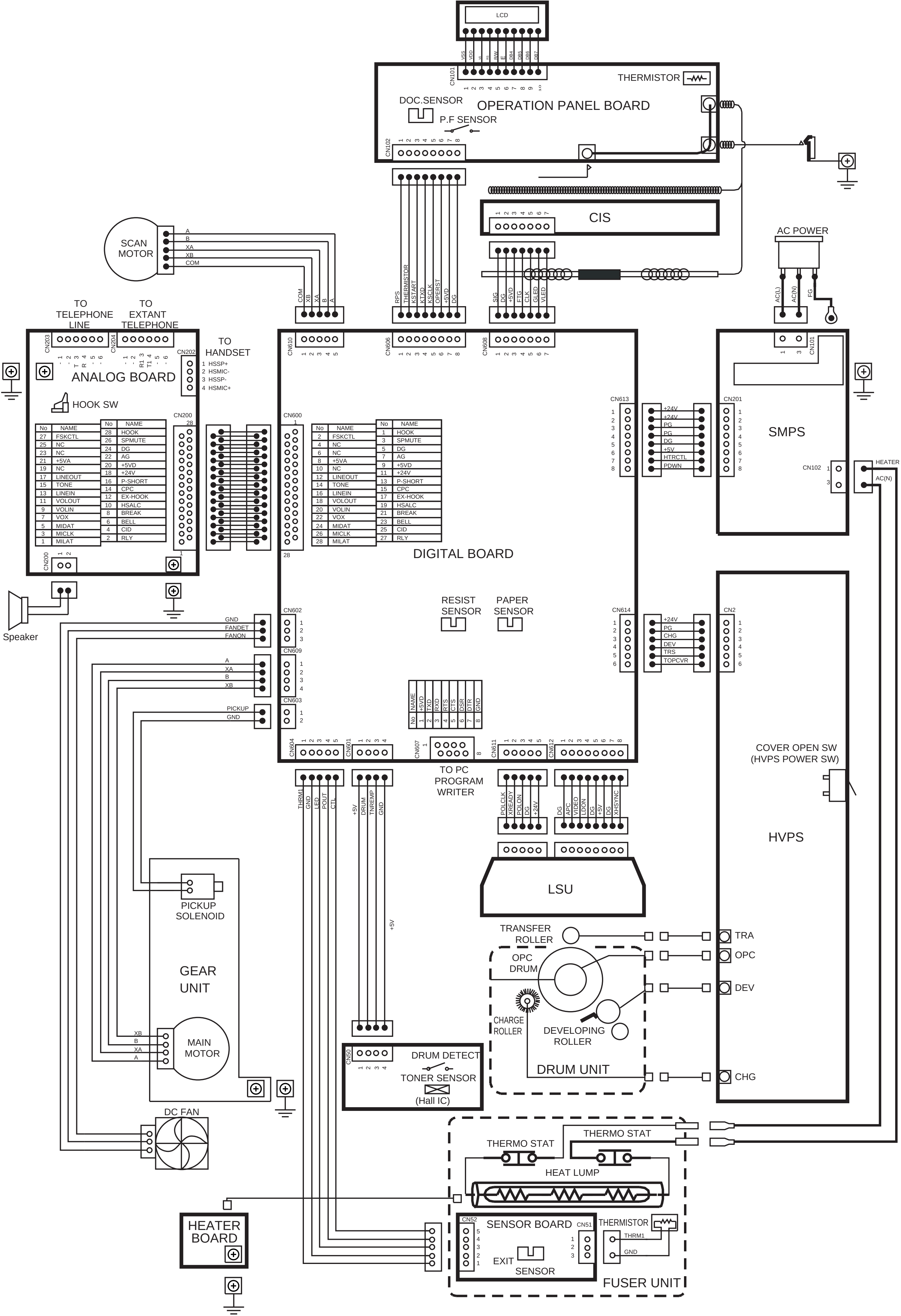
PFUP1331ZB-D (PFUP1331YA-D)

KX-FL512CX VARISTOR BOARD (PCB8)


TP_AMON
X603
UTO-CH
C697
R706
C695
R704
C706
C705
L623
L624
L625
L626
Q609
E
R707
C738
Q614
E
R722
+2.5V
C672
C720
IC608
1
5
4
C719
C736
R724
C721
Q623
Q615
E
E
6
CN614
R747
Q622
E
CN612
C731
C717
R723
L620
L621
8
1
L632
76
75
L661
L660
L659
L658
C694
100
IC605
1
51
50
C668
L618
L619
L630
C728
5
R610
R613
CN610
Q616
Q617
E
E
8
L653
REF-CH
L654
RA610
R611
C608
L655
L642
1
16
Q613
E
R737
C734
CN613
L657
L656
R768
R769
R767
25
26
C666
C667
RA609
+3.3V/BAT
L643
IC610
R736
E
Q620
TP_RTS
D602
R708
L605
L606
L604
8
RA602
+
BAT600
J600
F605
25
D608
L648
C726
C648
1
8
9
D607
PFUP1330YA
PbF
+24V
MARKED

KX-FL512CX DIGITAL BOARD (PCB4) COMPONENT VIEW


Spring
Pressure Roller
Paper Path
Heat Roller
Thermistor
Halogen Heater
Thermostat and Thermal Fuse



LCD
VSS
VDD
V0
RS
R/W
E
DB4
DB5
DB6
DB7
CN101
THERMISTOR
DOC.SENSOR
OPERATION PANEL BOARD
P.F SENSOR
CN102
CIS
AC POWER
AC(L)
AC(N)
FG
SCAN MOTOR
A
B
XA
XB
COM
TO TELEPHONE LINE
TO EXTANT TELEPHONE
TO HANDSET
CN203
CN204
CN202
1 HSSP+
2 HSMIC-
3 HSSP-
4 HSMIC+
ANALOG BOARD
HOOK SW
CN200
Speaker
RPS
THERMISTOR
KSTART
KTXD
KSCLK
OPERST
+5VD
DG
SIG
DG
+5VD
FTG
CLK
GLED
VLED
CN610
CN606
CN608
CN600
CN613
+24V
+24V
PG
PG
DG
+5V
HTRCTL
PDWN
CN201
SMPS
CN101
CN102
HEATER
AC(N)
DIGITAL BOARD
RESIST SENSOR
PAPER SENSOR
CN602
GND
FANDET
FANON
CN609
A
XA
B
XB
CN603
PICKUP
GND
CN614
+24V
PG
CHG
DEV
TRS
TOPCVR
CN2
CN604
CN601
CN607
CN611
CN612
TO PC PROGRAM WRITER
THRM1
GND
LED
POUT
CTL
+5V
DRUM
TNREMP
GND
POLCLK
XREADY
POLON
DG
+24V
DG
APC
VIDEO
LDON
DG
+5V
DG
XHSYNC
LSU
COVER OPEN SW (HVPS POWER SW)
HVPS
PICKUP SOLENOID
GEAR UNIT
MAIN MOTOR
XB
B
XA
A
+5V
TRANSFER ROLLER
OPC DRUM
CHARGE ROLLER
DEVELOPING ROLLER
DRUM UNIT
TRA
OPC
DEV
CHG
CN50
DRUM DETECT
TONER SENSOR
(Hall IC)
DC FAN
THERMO STAT
THERMO STAT
HEAT LUMP
HEATER BOARD
CN52
SENSOR BOARD
EXIT SENSOR
CN51
THERMISTOR
THRM1
GND
FUSER UNIT

CN200

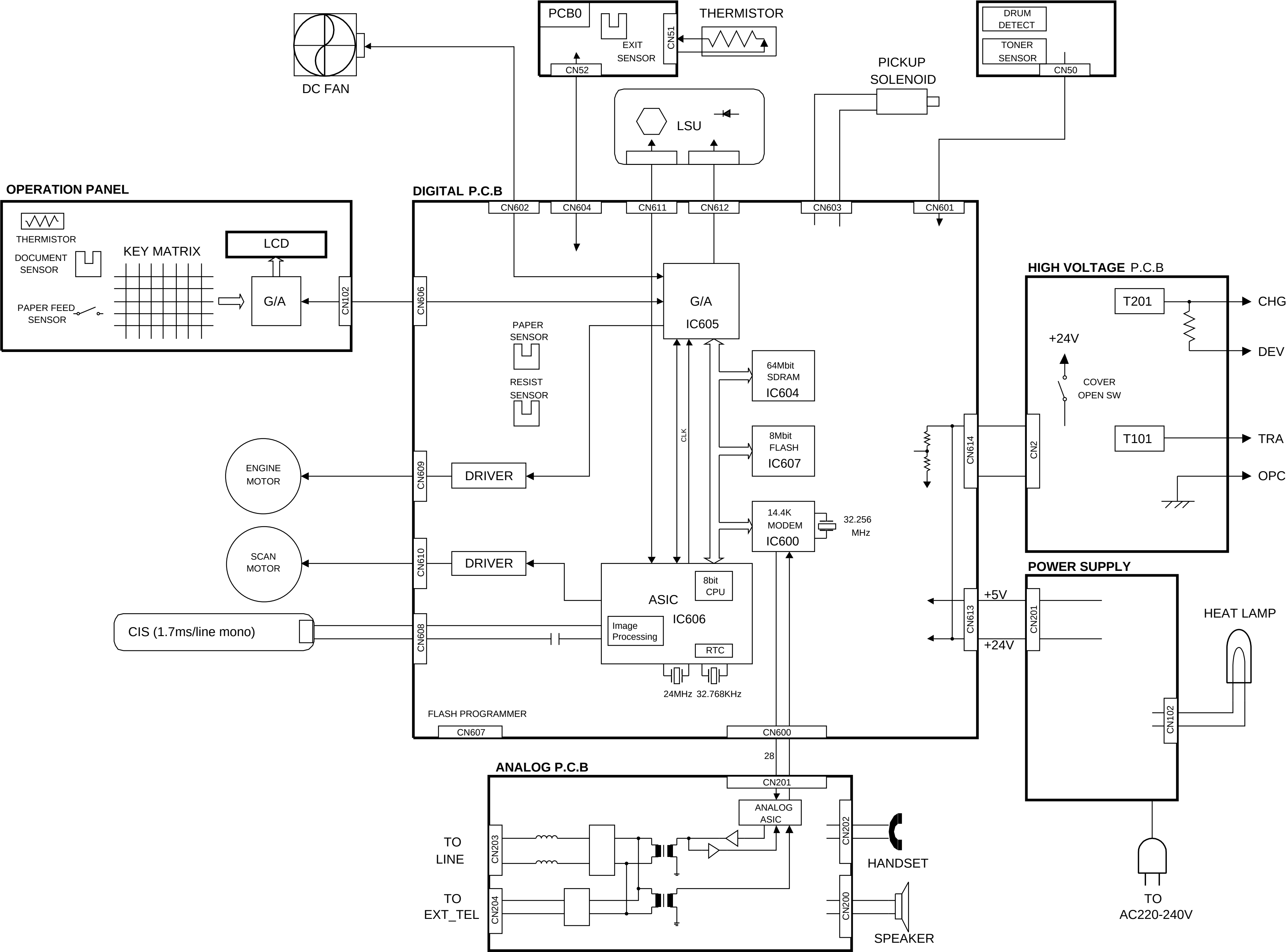
No	NAME	No	NAME
27	FSKCTL	28	HOOK
25	NC	26	SPMUTE
23	NC	24	DG
21	+5VA	22	AG
19	NC	20	+5VD
17	LINEOUT	18	+24V
15	TONE	16	P-SHORT
13	LINEIN	14	CPC
11	VOLOUT	12	EX-HOOK
9	VOLIN	10	HSALC
7	VOX	8	BREAK
5	MIDAT	6	BELL
3	MICLK	4	CID
1	MILAT	2	RLY

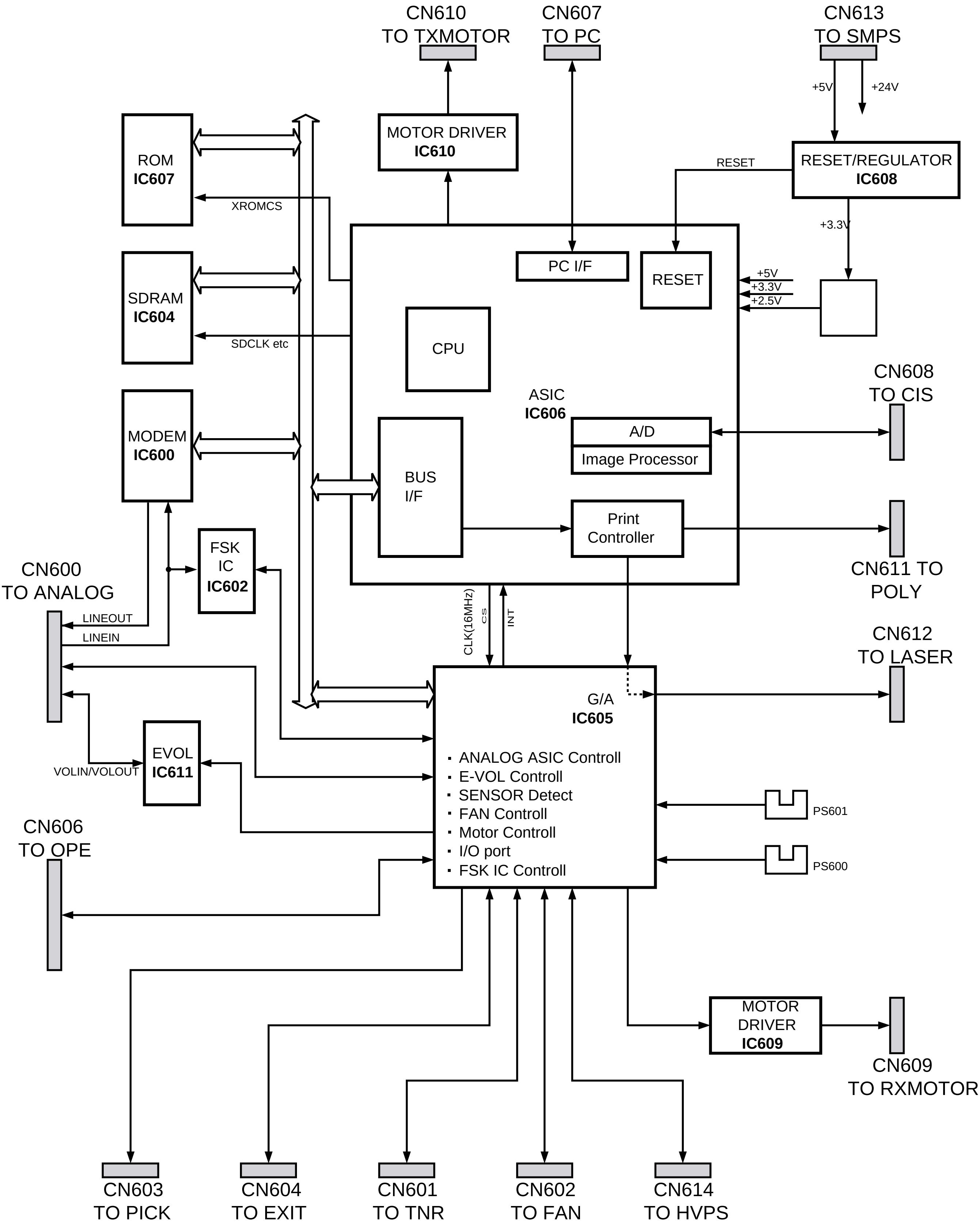
CN600

No	NAME	No	NAME
2	FSKCTL	1	HOOK
4	NC	3	SPMUTE
6	NC	5	DG
8	+5VA	7	AG
10	NC	9	+5VD
12	LINEOUT	11	+24V
14	TONE	13	P-SHORT
16	LINEIN	15	CPC
18	VOLOUT	17	EX-HOOK
20	VOLIN	19	HSALC
22	VOX	21	BREAK
24	MIDAT	23	BELL
26	MICLK	25	CID
28	MILAT	27	RLY

CN607

No	NAME
1	+5VD
2	TXD
3	RXD
4	RTS
5	CTS
6	DSR
7	DTR
8	GND


DC FAN
PCB0
EXIT
SENSOR
CN51
CN52
THERMISTOR
DRUM
DETECT
TONER
SENSOR
CN50
PICKUP
SOLENOID
LSU
OPERATION PANEL
THERMISTOR
DOCUMENT
SENSOR
KEY MATRIX
LCD
G/A
CN102
PAPER FEED
SENSOR
DIGITAL P.C.B
CN602
CN604
CN611
CN612
CN603
CN601
CN606
G/A
IC605
PAPER
SENSOR
RESIST
SENSOR
CLK
64Mbit
SDRAM
IC604
8Mbit
FLASH
IC607
14.4K
MODEM
IC600
32.256
MHz
ENGINE
MOTOR
CN609
DRIVER
SCAN
MOTOR
CN610
DRIVER
ASIC
IC606
8bit
CPU
Image
Processing
RTC
CIS (1.7ms/line mono)
CN608
24MHz
32.768KHz
FLASH PROGRAMMER
CN607
CN600
28
CN614
CN613
+5V
+24V
HIGH VOLTAGE P.C.B
T201
CHG
DEV
+24V
COVER
OPEN SW
CN2
T101
TRA
OPC
POWER SUPPLY
CN201
HEAT LAMP
CN102
TO
AC220-240V
ANALOG P.C.B
CN201
ANALOG
ASIC
CN202
HANDSET
TO
LINE
CN203
TO
EXT_TEL
CN204
CN200
SPEAKER


CN610
TO TXMOTOR
CN607
TO PC
CN613
TO SMPS
+5V
+24V
ROM
IC607
MOTOR DRIVER
IC610
RESET
RESET/REGULATOR
IC608
XROMCS
+3.3V
PC I/F
RESET
+5V
+3.3V
+2.5V
SDRAM
IC604
SDCLK etc
CPU
CN608
TO CIS
ASIC
IC606
MODEM
IC600
A/D
Image Processor
BUS
I/F
Print
Controller
FSK
IC
IC602
CN600
TO ANALOG
CN611 TO
POLY
LINEOUT
LINEIN
CLK(16MHz)
CS
INT
CN612
TO LASER
G/A
IC605
EVOL
IC611
VOLIN/VOLOUT
・ANALOG ASIC Controll
・E-VOL Controll
・SENSOR Detect
・FAN Controll
・Motor Controll
・I/O port
・FSK IC Controll
PS601
PS600
CN606
TO OPE
MOTOR
DRIVER
IC609
CN609
TO RXMOTOR
CN603
TO PICK
CN604
TO EXIT
CN601
TO TNR
CN602
TO FAN
CN614
TO HVPS